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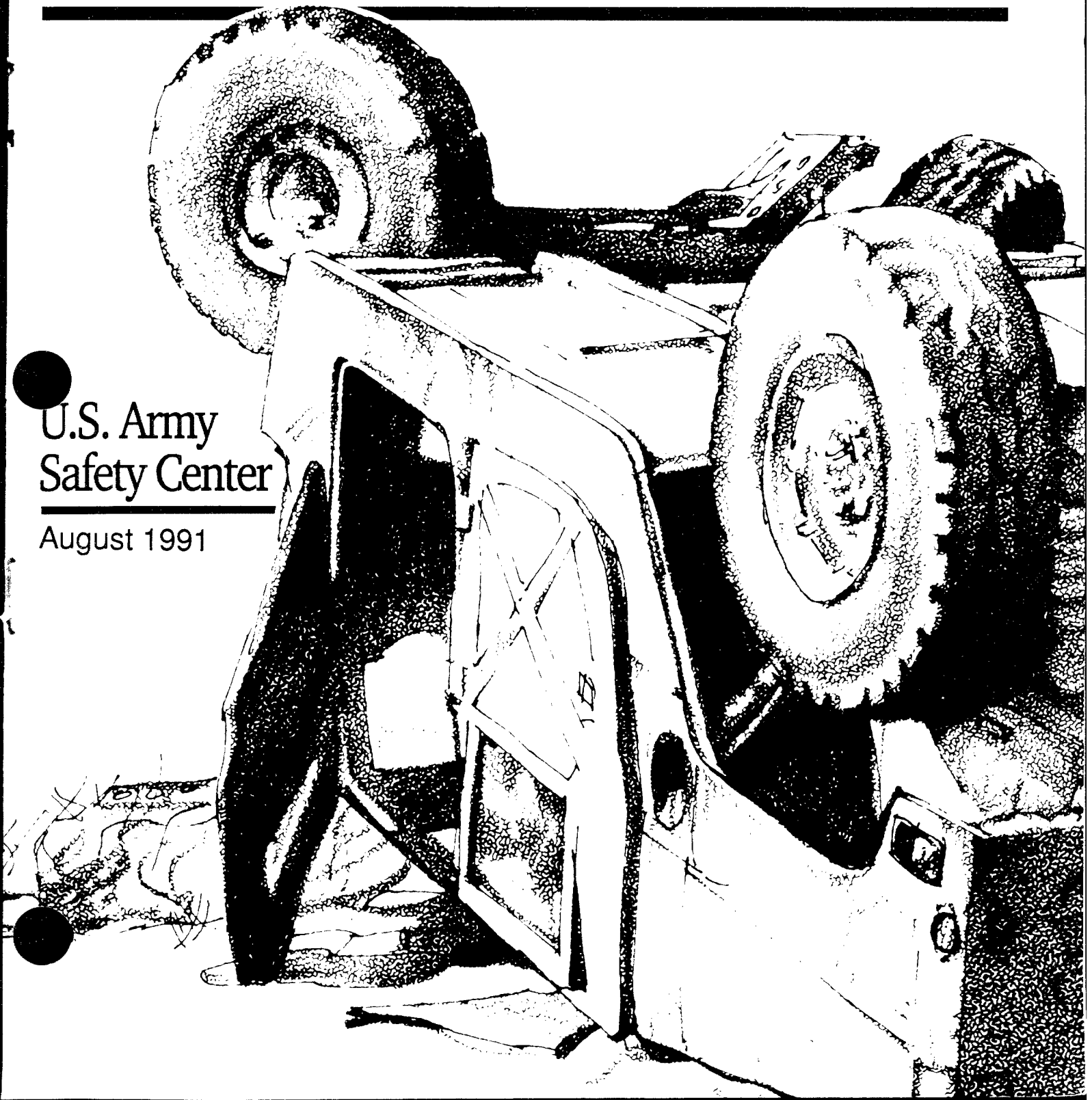
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# Accident Investigators **HANDBOOK**

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U.S. Army  
Safety Center

August 1991



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## CHAPTER 1 - PREDEPLOYMENT PLANNING

### SECTION I - Actions at USASC

#### A. GENERAL.

1. The success and efficiency of any accident investigation depends a great deal on the thoroughness and standardization of the advance planning. This section is designed to be used by each investigation board prior to deployment to the field.

2. The Board President has the primary responsibility to ensure that the actions are executed prior to deployment. It is the responsibility of each individual to ensure that he is completely prepared prior to notification for deployment. Predeployment preparation is critical to the smooth transition into a field investigator mode.

3. Because deployment is time-sensitive, team members should maintain deployment bags. Deployment bag content is the individual's preference. Team member should carry approved USASC investigation forms and that equipment necessary for completion of the investigation process.

#### B. TEAM STANDBY.

1. For deployment purposes, investigation teams are on 24-hour standby. As a minimum, there will be a first-up and second-up team at all times. Standby is normally 7 days in duration and changes every Wednesday at 0800. At that time, teams rotate up in order (second-up to first, third-up to second, etc.). Operations is responsible for notifying each team member of changes and beeper assignments.

2. Beepers are normally issued to the first- and second-up teams. However, only the first-up team members are required to monitor them. Each first-up team member is responsible for ensuring he can be reached by either telephone or beeper. Each beeper has a 25-mile range radius. However, it is the responsibility of each member to ensure he is within beeper range by having the beeper dispatcher page him upon reaching his destination.

3. The second-up team is not required to monitor beepers until it assumes first-up status. If a second-up team member departs the immediate area, he must leave a telephone number where he can be reached with Operations or the USASC staff duty officer (SDO). As a rule, he should not venture more than a 2-hour drive from Fort Rucker without the consent of the chief investigator or his appointed representative.

4. Investigators that are not first-up or second-up have no responsibility for notification, and the instructions above do not apply.





## SECTION II - NOTIFICATION/DEPLOYMENT

### A. GENERAL.

1. There are several very critical actions which must be accomplished as soon as practical after the notification and deployment decision. The majority of these actions are the shared responsibility of the Operations Division and the Board President; however, each investigator will have certain actions to accomplish. Certain information must be obtained from the installation safety personnel and several "requirement" requests must be made to ensure a smooth transition upon arrival of the CAI Team.

2. Upon notification, the Operation Division will complete the Initial Notification Information (see forms for air/ground at Appendix B) and notify the Chief, Investigation Division or his on-duty representative. The Chief, Investigation Division will, in turn, consult the Director, Investigation Directorate (IO), with deployment recommendations.

3. Once the decision to deploy is made, the Operation Branch will notify the on-site POC of the decision and make him aware of the POC requirements at Appendix C. Concurrently, Operations will notify the first-up team members and brief them per the information obtained in para A 2. above. Every attempt should be made by Operations to provide a complete initial briefing prior to the team members' departure from quarters with deployment bags. Normally, 2 hours should be allocated for team preparation after they have been notified.

### B. BOARD MEMBER ACTIONS UPON NOTIFICATION.

1. Upon receiving the initial notification, the Board President should, time permitting, contact the accident site safety personnel. Afterwards, he should ensure his team is briefed in accordance with the Investigation Team Deployment Briefing Checklist (ITDBC), Appendix D, as early as possible. Information unavailable during the Operations Branch's initial briefing, such as departure times, or situation updates should be forwarded telephonically to team members at their quarters as they prepare for departure.

2. As required, each team member or a designated team representative will return to Operations to pick up appropriate equipment and documents listed in the ITDBC. This normally includes:

- a. Orders.
- b. Initial Notification Information Form.
- c. Calling Card.
- d. Sign out on DA Form 647-1 (may be done during preparatory or final departure).
- e. Commercial tickets (TR's) and travel itineraries.
- f. Security clearance or memo/letter for certain areas such as Honduras, El Salvador, or Persian Gulf.
- g. Passports, if required.
- h. Film and batteries.

3. Time permitting, the Board President, will return to or telephone Operations for a final/departure guidance briefing from the Chief Investigator or his on-duty representative. Operations will ensure that the Board President is provided with commercial and AUTOVON telephone numbers for the installation POC prior to departure.

### SECTION III - FIELD RESPONSIBILITIES

#### A. BOARD PRESIDENT'S RESPONSIBILITIES.

1. The Board President will be responsible for the management, administration, supervision, and coordination of the entire investigative effort. He will ensure that the team members are provided the necessary personnel/equipment to complete the investigation. Some of the Board President's tasks are as follows:
  - a. Conduct Initial Board Briefing per checklist provided at Appendix E.
  - b. Coordinate with the site point of contact (POC) for administrative support per checklist at Appendix C (POC Checklist).
  - c. Provide courtesy inbrief to battalion/brigade commander, as appropriate (Appendix F).
  - d. Arrange for transportation and billeting.
  - e. Contact USASC Operations daily and provide preliminary updates.
  - f. Continuously keep informed as to progress of the investigation.
  - g. Assist other Board members as necessary.
  - h. Assign responsibility for all required forms.
  - i. Complete para 1, History of Flight for aviation accidents or Sequence of Events for ground accidents, of the Narrative. In addition, write findings and recommendations, and analysis, and the command paragraph of the narrative in conjunction with data obtained from the deliberation phase.
  - j. Before leaving the field site, ensure the entire report is completed in at least "draft form" to the extent possible, to include Name, Signature, SSN, Grade, Br, Address and Telephone Numbers on DA Form 2397-14-R or USAC Form 5-84.
  - k. Coordinate, prepare, and present the necessary outbrief.
  - l. Call in civilian overtime hours to Operations NLT 0800 every Monday.
2. Daily updates. The board president is required, on a daily basis, to contact the safety center and update the accident data, to include reviewing and correcting the accident synopsis originally contained on the PRAM. USASC needs this information in order to track the board's progress. The outline for providing the information is contained in Appendix CC.

#### B. RESPONSIBILITY FOR DATA COLLECTION.

1. Before leaving the field site, the board must ensure that all substantiating data, photos, completed drafts, and required report information is in their possession. Any discrepancies will be brought to the attention of the Board President. The Recorder's duties, in addition to those normally performed as a member of either the human factors or materiel factors work groups, are as described below in paragraph c, pg 1-6 to include:
  - a. Upon return to the USASC, the Recorder will be responsible for submitting the report in draft form and required material to Report Processing Section (RPS) for processing.

b. Should the Recorder need assistance in completing the draft report in a timely manner, he will coordinate with the Board President in sufficient time to allow the Board President to ensure that the draft report is completed within five working days.

c. BOARD MEMBERS DUTIES. Based upon guidance from the Board President and personal preferences, the remaining board members will be assigned to work groups for human factors and materiel factors. Appendix G outlines suggested assignments for these groups and the Board President.

1. Human Factors. The group for this area will complete items in paragraph 2 (Human Factors [HF]) of the Narrative (see Appendices J & K). The HF group will normally have the flight surgeon/medical doctor, Army Research Institute representatives, IP or senior operator, and other appropriate HF-oriented personnel in the group. Specific duties of the HF's group include, but are not limited to:

- a. Obtain/review training records, performance records, personnel records, and other background information on personnel involved in the accident. Obtain board orders from local command (See Appendix Q).
- b. Responsible for conducting the administrative portion of witness interviews, i.e., brief witnesses, gather header information, etc.
- c. Check on the status of alcohol/urinalysis testing.
- d. Review protective/escape/survival/rescue data.
- e. Analyze any effects of weather on the accident.
- f. Review unit SOP/appropriate regulations.
- g. Determine if injuries or results of the autopsy might give additional information to the investigative process.

2. Materiel Factors. The group for this area will complete items in paragraph 3 (Materiel Factors [MF]) of the Narrative (Appendices J & K). The MF group would normally have maintenance personnel or technical advisors in the group. Specific duties of the MF's group include, but are not limited to:

- a. Evaluation of maintenance/materiel data, to include the effects of fire. A format is provided at Appendix Q when a certificate of damage and disposition certification are required.
- b. Completion of the wreckage diagram or accident site diagram (See Appendix Y).
- c. Other maintenance/flight data associated with the DA 2397 series/DA Form 285 forms.
- d. Follow-on maintenance evaluations with the Corpus Christi Army Depot (CCAD) or other Army Materiel Command (AMC) agencies.

## CHAPTER 2 - FIELD INVESTIGATION

### SECTION I - GENERAL

The field phase of the investigation encompasses all proceedings from the deployment of the team through the command outbriefing. The primary reference for accomplishment of the investigation is DA Pam 385-95 and this document.

### SECTION II - INITIAL ARRIVAL

#### A. POINT OF CONTACT COORDINATION.

The first requirement after arrival is to establish contact with the unit/installation point of contact (POC). This person is responsible for providing everyday assistance in making the administrative details as simple as possible. The things which should be discussed with this individual are outlined in the Point of Contact Checklist, Appendix C (individual checklists are provided for both air/ground accidents).

#### B. INITIAL BOARD BRIEFING.

After completing the arrival in-briefing, the next step is to get all of the board members together, organize and brief them on what is going to happen, what each board member's responsibilities will be, and how the investigation will be conducted. The initial board briefing should, as a minimum, include the items listed at Appendix E.

#### C. INITIAL ACTIONS OF THE BOARD.

1. If additional board members from outside the supporting installation are required (e.g., Natick Lab, AVSCOM representatives, or others, see appendix BB), notify USASC ASAP. Generally, the first order of business should be to ensure the board is properly qualified, briefed, and organized before departing for the accident scene. However, there are extenuating circumstances which may dictate that available board members go directly to the scene. The circumstances might include impending weather, nonavailability of all board members, civil authority requests to clean up the accident scene, or hazardous site conditions which dictate wreckage removal. The checklists (ground or aviation) at Appendix C should be utilized to ensure that all administrative requirements are accomplished upon arrival. The POC should assist in obtaining all records and documentation required by the board.

2. The next step after visiting the accident scene is to provide a courtesy inbrief (see Appendix F for sample) to the local commander. This could be conducted at the accident site.

### SECTION III - FORMS

#### A. AVIATION ACCIDENTS - 2397 SERIES FORMS.

1. Responsibility for obtaining information and completing the various forms should be assigned by the president at the initial board meeting. Assignments should be made with consideration of which work group will have the particular information required. Suggested assignments are at Appendix G. A description of forms is listed below:

##### a. USASC Form 5-84/DA Form 2397-14-R Checklist (Right Side).

<u>DA FORM</u>	<u>DESCRIPTION</u>	<u>PARA NO.</u> <u>(DA PAM 385-95)</u>	<u>TAB</u>
2397-R	Statement of Reviewing Officials	8-4	A
2397-1-R	Summary	8-5	B
2397-2-R	Findings/Recommendations	8-6	
2397-3-R	Narrative	8-7	D
2397-4-R	Witness Statements	8-8	E
2397-5-R	Wreckage Distribution	8-9	F
2397-6-R	Impact/Crash Damage	8-10	G
2397-7-R	Maintenance/Materiel	8-11	H
2397-8-R	Personal Data	8-12	I
2397-9-R	Injury Data	8-13	J
2397-10-R	Escape/Survival/Rescue	8-14	K
2397-11-R	Weather Data	8-15	L
2397-12-R	Fire Data	8-16	M
2397-13/14-R	Index	8-17	

##### b. USASC Form 4-84/DA Form 2397-13-R Checklist (Left Side).

<u>TAB</u>	<u>TITLE</u>	<u>ASSGND</u>	<u>COMPLD</u>	<u>PRFD</u>
1	Board Orders			
2	Weather Reports			
3	Certificate of Damage/ECOD			
4	Photos, Maps, Diagrams			
5	EIR/QDR Information			
6	Laboratory Analysis			
7	Directives, Regulations, etc.			
8	Autopsy Report (DD Form 1322)			
9	Equipment Inspection & Maintenance Record			
10	Equipment Modification Record			
11	Additional Information			
12	Additional Information			

DA Forms 2397-13-R (left side) and 2397-14-R (right side) should be utilized to track completion of forms and gathering of supporting documents to ensure that all required items are obtained prior to departure from the field site.

**B. GROUND ACCIDENTS - DA FORM 285.**

1. The composition of ground reports (right/left sides), USASC Form 4-84, is shown at Appendix H.

2. The only DA form required for this report is DA Form 285. Form 285-1 has been eliminated. The new DA Form 285, dated 1 October 1991, should be utilized for all USASC investigations (when the "as of" date is announced). Instructions are self-explanatory for the completion of this form.

**SECTION IV - DATA COLLECTION**

**A. GENERAL.**

Data collection is participated in by all members of the board, as directed, and may occur as simultaneous efforts by the various work groups. It provides the factual evidence used to complete the appropriate forms and records. It also provides the general and detailed knowledge used later during the deliberation phase. Means of data collections are detailed in the preceding subparagraphs.

**B. WITNESS PROCEDURES.**

1. It is generally best to begin the investigation by interviewing surviving crewmembers and eyewitnesses. They are usually your best source of information in determining the accident sequence. It is important to interview witnesses as soon as possible. If there are no eyewitnesses, then as much factual information about the accident as is available should be assembled and briefed to the board just prior to going to the accident site. The person most knowledgeable on the mission, personnel involved, and any other accident elements should be at the accident site if there are no witnesses available. Before attempting to conduct interviews, get organized to minimize your interruptions. See Appendix W for promises of confidentiality and instructions to witnesses.

2. The initial interview should be conducted in a quiet, comfortable location and should be taped (need the witness' permission). If possible, the entire accident board should be present during the initial interview of key witnesses. Before initiating the interview, the board should obtain "header information" from each witness. In some instances, the witness may have to be taken to the accident site after the initial interview for clarification of his/her statement.

a. Place the witness at ease. The individual's good will is a distinct asset.

b. Explain the purpose of the investigation, the value of the statement, and the confidentiality promise if appropriate.

- c. Read a witness's written statement before the interview, use it to get questions or verify his credibility
- d. Explain that you will be recording his statement unless he objects.
- e. Only one investigator should ask questions at a time.
- f. Do not embarrass a witness by reacting to obvious errors.
- g. Do not show impatience.
- h. Do not lecture the witness on correct procedures or requirements.
- i. Avoid collective interviews (interviewing more than one witness at a time).
- j. Have a mental outline for areas of questioning.
- k. Use two tape recorders for critical statements.
- l. Permit witness to tell the story in his/her own words (do not interrupt).
- m. Avoid leading questions.
- n. Do not insist on a yes/no answer.
- o. Ask one question at a time.
- p. Do not assist witness in answering questions.
- q. Avoid revealing to witness items discovered during investigation.
- r. Keep on the subject.
- s. Be unobtrusive in notetaking.
- t. Interview--do not interrogate.
- u. Remember: be friendly.
- v. Respect the emotional state of the witness.
- w. Remember: the witness does not even have to talk with you.

Normally, the interview would begin by asking the witness's name, duty position, and location during the accident. Then ask the witness to tell everything that he remembers about the accident. Other questions may include items from history of flight/events, human factors, or material factors checklists. Usually, it is advantageous to move from general to specific questions. Also, get his opinion on what caused the accident.

#### C. FORMS FOR WITNESS DATA.

1. DA Form 2397-4-R, Summary of Witness Interview is used by aviation accident investigation boards to record statements of commanders, supervisors, maintenance and ground support personnel, and others who are able to contribute information concerning the accident. Ground witness statements are summarized on bond paper.

2. Procedural Guidelines. Procedural guidelines for completion of DA Form 2397-4-R are delineated in chapter 8, DA pamphlet 385-95. Ground statements may be summarized on bond paper utilizing appropriate header information to identify the individual, his SSAN, unit, MOS, date interviewed, and interviewer.

#### D. ACCIDENT SCENE DATA COLLECTION.

It is considered imperative that all members of the Board view the accident site as soon as possible after being briefed by the POC and witness's as appropriate in order to have a general mental



picture of what occurred. If the time of day will not permit at least 30 to 45 minutes of daylight at the site, then it may be advisable to wait until the next morning. This decision must be tempered with the advice of local personnel familiar with the area. General procedures for actions in surveying an accident site are shown at Appendix I.

#### E. PHOTOGRAPHIC REQUIREMENTS.

1. The board president should assign a teammember the responsibility for ensuring that all necessary photographs are taken. The materiel factors work group leader is usually a good choice. Both regular slides and prints should be taken. If an installation photographer is provided, he should be supervised by the board member in charge of photographs. Remember: It is always better to have too many photos rather than not enough.

2. A photographic checklist is shown below:

<u>PHOTOS NEEDED</u>	<u>GROUND</u>	<u>AIR</u>
Aerial view from four directions (N, S, E, W)	N/A	X
Ground view from four directions (N, S, E, W)	X	X
General overview of wreckage beginning at nose and circling with a photo every 45°	N/A	X
Photos of any ground scars	X	X
Photos of major components/ controls/parts	X	X
Instrument panel and consoles	X	X
Cockpit/cabin/cab areas (include) seats/restraining systems)	X	X
Canopy/ejection seat	N/A	X
Detailed photos of suspected failed parts	X	X
Other photos deemed necessary	X	X

NOTE: X (if required)

## SECTION V - NARRATIVE DATA

A. For ground accidents, the narrative format is shown at Appendix J.

B. A detailed guideline to complete the narrative portion (history of flight, human, materiel, and environmental factors) of an aircraft accident is enclosed at Appendix K.

## CHAPTER 3 - DATA ANALYSIS

### SECTION I - GENERAL

At some point during the investigation, the data collection phase will be completed. At this point no remaining sources of information are available or expected. The requirement now is to analyze the data and to structure the results into a format that clearly shows the inter-relationship between the cause-related errors/failures and the system inadequacies which caused or permitted them to occur. The method used for this analysis is the board deliberations with all board members present.

### SECTION II - DELIBERATIONS

A. ACTIONS BY BOARD PRESIDENT PRIOR TO DELIBERATION. The board president will brief the board members prior to convening the deliberations to facilitate more efficient proceedings. The deliberations will be attended by all appointed board members. If approved by the board president, other individuals such as the installation/unit safety POC or technical advisors may attend the deliberation proceedings. The board president is responsible for the supervision of deliberations. The board president should cover at a minimum, the following items prior to initiating the deliberation process:

1. Methods of Deliberations (see Section II, B, below).
2. Categories of Findings (DA Pam 385-95, para 8-6, for both air/ground accidents).
3. Guidelines for categorizing specific deficiencies (DA Pam 385-95, para 8-6, for both air and ground accidents).
4. Submission of a completed report.
5. Disposition of completed report.
6. Role of the board members at the command outbrief.

#### B. DELIBERATION PROCESS.

1. There are several methods to effectively conduct the actual deliberations; however, it is of utmost importance to impress on each board member that every abnormality, regardless of perceived individual importance, be brought to the attention of the whole board during deliberations. The following is the method that is suggested for use. It ensures that all deficiencies are addressed, provides graphic exposure of timing, produces a written record of the deliberations, and provides a framework to write the Analysis paragraph. First, determine all abnormalities discovered during the data gathering process by going through a process in which the individual areas are written on a chalkboard or butcher chart and abnormalities in each area are listed. A listing of individual areas is provided below to aid the board in identifying abnormalities/discrepancies.

##### a. History (Air/Ground)

- Medical problems

- Personnel records (discrepancies)
- Review of flight records (air only)
- Review driving records (discrepancies with DA Form 348, training records, and SF 46)
- Was the mission approved?
- Was there adequate mission notification (preparation)?
- Was the pilot/crew/driver qualified?
- Look at pilot/crew/driver rest
- Equipment condition/maintenance trends
- SOP adequacy
- Accident experience of aircrew/driver

b. Premission accomplishments

(1) Aircraft accidents

- Aircraft inspection by crew
- Aircraft condition
- Crew preplanning and coordination
- Perceived urgency of mission
- Weather briefing
- Mission requirements
- Flight plan
- Run-up procedures
- SOP followed

(2) Ground accidents

- PMCS completed properly
- Vehicle dispatched properly
- Operations order complete (if applicable). Did it include safety?
- SOP followed
- Other discrepancies

(3) Mission/flight

(a) Aircraft accidents

- Compliance with mission requirements
- Mission conducted as planned
- Materiel/maintenance problems
- ATC support
- Weather conditions
- Regulations/SOP adherence
- Logistical support
- Aircrew Training Manual
- Terrain
- Environment

(b) Ground accidents

- Mission conducted as planned
- Materiel/maintenance problems
- Logistical support
- Weather conditions
- Soldiers Manual for task/condition/standard
- Regulations/SOPs adherence

(4) Postmission/postflight

- Egress problems/seat belts or rollover protection system (ROPS)
- Compromise, penetration, and reduction of occupiable space.
- Rescue timely or any problems
- Preaccident plan
- Security of accident site.

During this phase of the deliberations, do not just try to determine cause factors; list all the problems/abnormalities noted during the data gathering process.

After ensuring that all abnormalities and problems have been listed, go to an event chart to determine actual cause factors. Start with the mishap and go back in time and list the events leading up to the mishap, then go forward in time for egress and rescue (see example on next page).

2. After completion of the event chart, one should be able to write the findings that were contributory to the mishap from what is listed on the chart. When all of the events have been listed on the chart, go back to your original list and cross out those things that are now on the event chart. The remaining abnormalities will either be present but not contributing factors, comments in the Analysis, or discarded as insignificant items. The Board should discuss each of the abnormalities and, based on this discussion, determine the category in which they belong. For each cause or abnormality, a task error/material failure/environmental condition, system inadequacy(ies) and remedial measure(s) will be developed. See DA Pam 385-95, para 8-6, for the proper way to structure a finding.

3. For many human error findings, the cause of the error can be attributed to a failure to establish, train, enforce, or follow standards. The premise being that safe performance is a predictable result of performing to standard, and performing to standard is a result of training to standard (see Appendix L).

4. The process above is conducted by the board president. After completion of the deliberations, the board president will write the analysis, findings, and recommendations. Prior to the command outbrief, the board should convene again to review and have an opportunity to make comments on the written results of the board president. Normally, there should be at least 24 hours between deliberations and the outbrief, allowing time for review and corrections.

5. Board members should be advised if they are not in agreement with the Board's findings, they may write a minority report which would be submitted to the Board President and included in the report. Details for completion of a minority report are contained in DA Pam 385-95, para 2-7.

### SECTION III - ANALYSIS

#### A. GENERAL.

1. The analysis of the accident is the board's consideration of why things happened. It should consider all facts or data in the narrative, 2397 series forms, or the DA Form 285. It should not restate elements of the narrative. The analysis should be reflective in determining the why of the accident in terms of task errors, materiel failures/malfunctions, or environmental factors.

2. The analysis should start out with the standard statement of human, materiel, and environmental considerations. Factors concluded as noncontributing should be addressed first and discounted as causes. Human factors or materiel factors paragraphs: do not draw conclusions and do not use adjectives/adverbs to describe facts. Keep it simple; if the particular system or factors were not involved, say it simply.

#### B. GUIDANCE FOR WRITING ANALYSIS.

As a guideline in writing the analysis section, Appendix M should be reviewed. For all Army accidents, one should also review Chapters 7 and 8 of DA Pam 385-95.

## CHAPTER 4 - POST INVESTIGATION ACTIONS

### SECTION I - STAFFING OF FINDINGS AND RECOMMENDATIONS

#### A. GENERAL.

1. When the Investigation Boards have completed the deliberations process in the field, a copy of the findings, recommendations, analysis and either a history of flight (for aviation) or a sequence of events (for ground) will be forwarded to USASC Operations for USASC staffing. The staffing process will normally be completed within 24 hours and the staffed product returned to the investigation board for consideration prior to the command outbriefing. The board, upon receipt of the staffed findings and recommendations, will carefully "tune" or bring them into line so they agree with the board's deliberations and are supportable by the facts and analysis resulting from the investigation. The Board President will write the outbriefing for use during the command outbriefing, the USASC inbriefing, and for the preliminary report.

2. After the board president has written the briefing, he should reconvene the board to brief the members as to exactly what will be said at the outbriefing. Any changes should be addressed at that time and differences resolved. The Board President will then brief the board as to the outbriefing procedures. A rehearsal should be conducted for all board members.

3. Upon completion of board deliberations, and receipt of the USASC staffed findings and recommendations, the board president will conduct a command outbriefing (format at Appendix N). A sample outbrief is at Appendix O.

B. Conduct the briefing.

C. Coordinate return transportation as directed by USASC.

### SECTION II - ACTIONS OF BOARD AFTER RETURN TO USASC

A. GENERAL: On return to USASC, the Investigation Board has a limited time to accomplish an inbriefing and turn over the draft accident report to the Accident Report Processing Branch (ARPB). The time schedule starts with the first duty day following the Board's return.

-- Within three duty days following return to USASC, the Board President will contact ARPB to schedule the inbriefing.

-- Within three duty days, the Board President will submit draft Preliminary Report to ARPB for processing

-- Within five duty days, the Board Recorder will submit the draft report to ARPB for processing.

(NOTE: ARPB will work order the photo and wreckage diagram or schematic support for inclusion in the accident report.)

B. PRELIMINARY REPORT: Within three days following the Board's return for duty at USASC, the Board President will provide ARPB with the required data for the Preliminary Report. Drafts may be on computer disk backed with hard copy or in pencil which is acceptable. Material required for the Preliminary Report includes:

-- one set of photo's with appropriate captions.

(NOTE: Don't plan to use these photos in the accident report as they normally will not be available.)

-- accident summary sheet (Preliminary Accident Report Summary).

-- sequence of events in the outbrief format.

-- latest findings and recommendations as out-briefed.

-- briefing attendees & command feedback.

-- copy of the Board's out-brief (minus the findings and recommendations which are under another tab).

C. INBRIEFING: On return from an investigation, the Investigation Board will, within three working days, contact ARPB for scheduling of the inbriefing. ARPB will schedule the conference room and coordinate the notification of the various interested parties.

D. ACCIDENT REPORT: Within five working days following the Board's return for duty, the draft accident report will be submitted to ARPB for processing. The draft report will contain:

1. Aviation accident reports: This report will be formatted IAW guidance in DA Pam 385-95.

(a) Report left side -- one copy of supporting documentation organized under the appropriate tabs.

-- pictures, negatives with proof sheet(s), or slides (least desirable) for the report with appropriate captions.

(NOTE: ARPB will work order photographic work remaining to be completed on Board's return to USASC.)

-- name and phone number of POC for pending results from local laboratories used during the investigation.

-- completed USASC Forms 500 for pending CCAD tear-down analysis.

-- name and phone number (both duty and off duty) of medical officer assisting Board on ground accidents. (USASC is



not an addressee on AFIP laboratory results for ground accidents.)

-- copy of EIR/QDR for material failure/malfunction accidents.

(b) Report right side - the applicable DA Form 2397 series forms completed in draft (legible pencil copies adequate).

-- DA Form 2397-2 information should be latest information as out-briefed. Bottom of form must be coded.

-- DA Form 2397-3 properly formatted IAW DA Pam 385-95 for the report.

-- DA Forms 2397-4 with interviews summarized. ARPB will provide one clear draft for minor corrections. (A three page summary will be considered unusually long).

-- information for DA Form 2397-5 is acceptable on note paper but must be legible. (NOTE: ARPB will work order wreckage diagrams and schematics to DOMM).

-- questions concerning DA Form 2397-6 should be resolved by the investigation board with the System Safety Branch engineers prior to submitting the report to ARPB.

-- ARPB will coordinate DA Forms 2397-8 thru -10 with the Flight Surgeon, when available, and with DOIT prior to the quality review of the report.

2. Ground accident reports: This report will be formatted much the same as the aviation accident report in that supporting documentation will be arranged under tabs on the left side of the folder and the report proper will be under appropriate tabs on the right side of the folder. (For report composition, see Appendix H).

(a) Left side of report -- tabs 1 thru 4 are fixed and sequenced. Photo support required upon the board's return, should be processed by ARPB to DOMM. Tabs subsequent to the first four, should be as required to substantiate key elements of the report. Generally, regulations and other publications which are applicable/available in most headquarters, need only be referenced. Special or unusual publications may require an extract be included as supporting documentation.

(b) Right side of report -- tabs A thru F are fixed and sequenced as depicted at Appendix H.

(1) Findings and recommendations at Tab B, will be formatted the same as in aviation accident reports with the task errors, system inadequacies, and remedial measures identifiable. The recommendations will be addressed as unit level action (thru battalion/squadron), higher level action

(thru Corps generally), and army level action (which includes MACOM's).

(2) Narrative of Investigation will be in the format as depicted at Appendix J. (NOTE: The History of Events paragraph is not the format to be used in briefings or in the preliminary report).

(3) The DA Form(s) 285 will be completed IAW the instructions accompanying the forms and the booklet titled "Unit Training Package - New DA Form 285" produced by USASC in January 1981.

(4) Witness summaries under Tab E should be suitable for the typing of a clean draft which will be processed through the review cycle to include the commander's review. The summaries should be in "third person" except where direct question and answer quotes are necessary for clarity.

(5) Accident site diagrams will be work ordered by ARPB to DOMM. Draft diagrams on note paper are adequate providing the information is legible.

D. REPORT REVIEW: During the report preparation process, a Board member, providing one is available, will be asked to review the accident report prior to it being submitted for the Director's Review. This quality control measure is to assure the report is complete and reflects the findings and conclusions of the investigative board.

## CHAPTER 5 - EXPLANATION OF APPENDIXES

A. GENERAL. Most appendixes listed on page iii have been identified and an explanation provided for their use. However, additional appendixes are attached. A brief description is shown below.

### B. OTHER APPENDIXES.

1. Appendix R. Electromagnetic Environmental Effects (E<sup>3</sup>). In some cases, E<sup>3</sup> could be related to the cause of an accident. If it is suspected to be present, follow the guidelines in this appendix.
2. Appendix S. Night Vision System Checklist. Certain accidents may involve the use of night vision goggles. If these devices were in use, it is important that all applicable data be collected in this area. The information provided at Appendix S will assist in evaluating weather, the equipment, and the operator.
3. Appendix T. Driver Training/Licensing. Most Army accidents involve a vehicle and an operator. Over the years, it has been noted that several deficiencies may exist in the unit's driver training program, and procedures to license operators. As a part of your investigation involving equipment and operators, the unit's driver training program should be evaluated to determine if the proper training has been conducted.
4. Appendix U. Flight Simulator Sickness Questionnaire. For use when personnel have flown a flight training period involving a visual display simulator, five days or less, prior to the accident. Simulator affects may have influenced the pilot/copilot.
5. Appendix V. Chemical Events. Guidance for the conduct of accident investigations that involve chemical materials.
6. Appendix X. Command Climate Questionnaire. As a part of the human factors investigation (para 2c of the narrative), the command climate of the unit should be evaluated to determine if this area had any influence on the outcome of the accident. Two checklists (one for aviation and one for ground units) are provided at Appendix X as a guide to evaluate this area.
  - a. Command climate comments should be addressed in paragraph 2c of the narrative.
  - b. Because of the sensitivity in this area, any serious deficiencies found should be discussed with the Chief of the Investigation Division (USASC) prior to disclosure of information to personnel in the field.
7. Appendix Z. Crew Coordination Checklist. Certain accidents may involve failures in crew coordination. The information provided at Appendix Z will assist in identifying any crew coordination problems that may have contributed to the accident.

8. Appendix AA. Format and Structuring of Findings and Recommendations. Guidance for the writing of the findings and recommendations.

9. Appendix BB. Collateral Board. Guidance as to the type of information that may be provided to the Collateral Board from the USASC Investigation Board.

10. Appendix CC. Daily Updates. Guidance for the Board President in order for the USASC to receive the daily updates and in the process keep the Safety Center on track with the investigation.

11. Appendix DD. Guidance for selecting the proper task error, materiel failure/malfunction, environmental condition, system inadequacy, and remedial measures.

... .. APPENDIX A

(Ref: AR 385-40, DODI 6055.7)

1. Aircraft Flight or Flight-Related Mishap. A mishap involving DOD aircraft when intent to fly exists.

a. Flight Mishaps. Those mishaps in which there is reportable damage to the aircraft itself. (NOTE: Explosives, chemical agent, or missile events that cause damage to a DOD aircraft with intent to fly are categorized as flight mishaps to avoid dual reporting.)

b. Flight-Related Mishaps. Those aircraft mishaps where there is intent for flight and no reportable damage to the aircraft itself, but the mishap involves fatality, injury to aircrew, ground crew or passengers, or other property damage. These mishaps are not to be used in the calculation of flight mishap rates.

2. Aircraft Ground Mishaps. Ground and maritime mishaps that involve damage or injury and/or fatality sustained from maintenance, handling, or servicing of aircraft without intent for flight. For DOD reporting purposes, however, these mishaps shall be included in either aircraft, ground, or maritime categories, as applicable.

3. Combat Training Mishap. Ground mishap that involves peacetime military operations. The term includes any one, or a combination of the following:

a. Combat Vehicle, Equipment Damage. Damage to combat equipment or vehicles such as tanks, self-propelled gun mounts, armored carriers, amphibious vehicles ashore, and field communication equipment in the course of operational training.

b. Combat Training Injuries. Personal injuries resulting from unique military training activities such as maneuvers, field training, parachuting, survival training, or explosive ordnance demolitions.

4. DOD Aircraft.

a. All manned weight-carrying devices supported in flight by buoyancy or dynamic action and are owned or leased by DOD Components (including Reserve forces and National Guard) that are:

(1) Operated and exclusively controlled or directed by a DOD Component.

(2) Furnished by the Government or on bailment to a non-DOD organization for modification, maintenance, repair, test, contract training, or experimental project for a DOD Component, when the Government has assumed ground and flight risk.

(3) Under test by a DOD Component. (This includes aircraft furnished by a contractor or another Government agency when operated by a DOD aircrew in official status and a DD Form 250, "Material Inspection and Receiving Report, has been executed to certify that the Department of Defense has accepted the aircraft.)

b. Does not include aircraft that are:

(1) Leased, on bailment, or loaned (except as specified in definition 4.a.(2), above) to contractors, commercial airlines, other Government Agencies, or foreign governments, when the lessee has assumed risk of loss.

(2) Civil aircraft owned by civil operators and accomplishing contract air missions for the DOD Components.

(3) Factory-new production aircraft until successful completion of the post-production acceptance flight. Mishaps that involve such aircraft are reported as contractor mishaps.

(4) Flying club aircraft or privately owned aircraft hangared on DOD installations.

5. DOD Mishap. An unplanned event, or series of events, that results in damage to DOD property; occupational illness to DOD military or civilian personnel; injury to DOD military personnel on or off-duty; injury to on-duty civilian personnel; damage to public and private property or injury and illness to non-DOD personnel caused by DOD operations.

6. DOD Personnel.

a. Civilian On-Duty. DOD Civil Service employees (including National Guard and Reserve technicians, unless in military duty status); nonappropriated fund employees (excluding part-time military); Corps of Engineers Civil works employees; Youth or Student Assistance Program employees; foreign nationals employed by DOD Components; and Army-Air Force Exchange Service employees.

b. Military. All U.S. military personnel on active duty; U.S. Military Reserve or National Guard personnel on active duty or in drill status; Service Academy cadets; Reserve Officer Training Corps (ROTC) cadets when engaged in directed training activities; foreign national military personnel assigned to DOD Components.

7. Duty Status Determination. These definitions are for mishap reporting purposes only and have no relation to compensability or line-of-duty determination.

a. On-Duty. When DOD personnel are:

(1) Physically present at any location (area under the control of a DOD Component) where they are to perform their officially assigned work. (This includes those activities incident to normal work activities that occur on DOD installations, such as lunch, coffee, or rest break, and all activities aboard vessels.)

(2) Being transported by DOD or commercial conveyance for the purpose of performing officially assigned work. (This includes reimbursable travel in private motor vehicles for performing temporary duty, but not routine travel to and from work.)

(3) Participating in compulsory physical training activities (including compulsory sports).

b. Off-Duty. When DOD personnel:

(1) Are not in an on-duty status, whether on or off DOD installations ashore.

(2) Leave departed official duty station, temporary duty station, or ship at termination of normal Ark schedule.

(3) Are on leave and/or liberty.

(4) Are traveling before and after official duties, such as driving to and from work.

(5) Are participating in voluntary base and/or installation team sports.

(6) Are on permissive (no cost to Government other than pay) temporary duty.

(7) Are on lunch or other rest break engaged in activities unrelated to eating or resting.

8. Mishap Severity Classification. DOD mishaps are classified according to the severity of resulting injury, occupational illness, or property damage. Property damage severity is generally expressed in terms of cost and is calculated as the sum of the costs associated with DOD property and non-DOD property that is damaged in a DOD mishap. Additionally, if injury or occupational illness results, an event is reportable even if the associated costs are less than the minimum dollar criteria. Classify DOD mishaps, as follows:

a. Class A Mishap. The resulting total cost of reportable damage is \$1,000,000 or more; a DOD aircraft, missile, or spacecraft is destroyed; or an injury and/or occupational illness results in a fatality or permanent total disability.

b. Class B Mishap. The resulting total cost of reportable property damage is \$200,000 or more, but less than \$1,000,000; an

injury and/or occupational illness results in permanent partial disability; or when five or more personnel are inpatient hospitalized.

c. Class C Mishap. The resulting total cost of property damage is \$10,000 or more, but less than \$200,000; a nonfatal injury that causes any loss of time from work beyond the day or shift on which it occurred; or a nonfatal illness or disability that causes loss of time from work or disability at any time (lost time case). Reporting this class of mishap is optional.

d. Class D Mishap. The resulting total cost of property damage is \$2,000 or more, but less than \$10,000, or a nonfatal injury that does not meet the criteria of a Class C mishap (no lost time case). Reporting this class of mishap is optional.

e. Class E Mishap (Aviation Only). The total cost of property damage is \$2,000 or less with no injury or occupational illness, or injury requiring only first aid. Examples are; precautionary landings, forced landings, and human factors events.

f. Foreign Object Damage (FOD) Incident. Reportable incidents confined to turbine engine damage as a result of internal or external turbine engine FOD. FOD incidents are to be reported as a separate category.



APPENDIX B

CASE NUMBER: \_\_\_\_\_

DATE: \_\_\_\_\_

CSSC-ID CAI INITIAL PRAM NOTIFICATION INFORMATION (AIRCRAFT)

1. CLASSIFICATION: CLASS A: \_\_\_\_\_ CLASS B: \_\_\_\_\_ CLASS C: \_\_\_\_\_ OTHER (Specify): \_\_\_\_\_
2. DATE OF MISHAP: \_\_\_\_\_ TIME OF MISHAP: \_\_\_\_\_ A/C NO: \_\_\_\_\_
3. TYPE OF AIRCRAFT: \_\_\_\_\_ MISSION OF AIRCRAFT: \_\_\_\_\_
4. TIME/DATE RECEIVED BY OPERATIONS: \_\_\_\_\_
5. UNIT: \_\_\_\_\_ MACOM: \_\_\_\_\_
6. POC: \_\_\_\_\_ POSITION: CDR: \_\_\_\_\_ SAFETY OFF: \_\_\_\_\_ OTHER: \_\_\_\_\_
7. LOCATION OF MISHAP: \_\_\_\_\_
8. HAZARDOUS/SENSITIVE MAT INVOLVED: YES: \_\_\_\_\_ NO: \_\_\_\_\_ SITE SECURED: YES: \_\_\_\_\_ NO: \_\_\_\_\_
9. FLIGHT DATA RECORDER: YES: \_\_\_\_\_ NO: \_\_\_\_\_
10. WEATHER CONDITIONS: VFR: \_\_\_\_\_ IFR: \_\_\_\_\_ DAY: \_\_\_\_\_ NIGHT: \_\_\_\_\_ NVG: \_\_\_\_\_ NOE: \_\_\_\_\_
11. PERSON WHO BRIEFED MISSION PARAMETERS: \_\_\_\_\_ POSITION: \_\_\_\_\_
12. TOTAL NO. PEOPLE ONBOARD: \_\_\_\_\_ OFF: \_\_\_\_\_ WO: \_\_\_\_\_ EM: \_\_\_\_\_ CIV: \_\_\_\_\_ HIGHEST RANK: \_\_\_\_\_  
NUMBER OF INJURIES: \_\_\_\_\_ NUMBER OF FATALITIES: \_\_\_\_\_

THE FOLLOWING INFORMATION IS FOR INTERNAL SAFETY CENTER USE ONLY!!!

13. SYNOPSIS OF ACCIDENT:

14. TEAM DISPATCHED: YES: \_\_\_\_\_ NO: \_\_\_\_\_ TEAM: \_\_\_\_\_
15. NEAREST AIRFIELD WHICH CAN HANDLE C-12: \_\_\_\_\_
16. NEAREST COMMERCIAL AIRFIELD: \_\_\_\_\_

<u>DISTRIBUTION:</u>		<u>NOTIFICATION:</u>	
CSSC -Z	CSSC -DA (3)		After Duty Hrs
-ZD	-M (2)	(225) 7293	HRS see SDO Book
-XO	-ME		
-ZM	-ZJA	(693-2066)	AVSCOM
-ZSM	-ZPA		
-PPPD	-ZNG	(284-9475/9340)	AMC
-S	-DA (Gill)		
-SPA	-ZR	(291-2800-3262)	AFIP
-SE (2)	-I		
OPNS FILE (2)	-ID		MACOM
BOARD PRES & MEMBERS			
(255-2388/After Duty Hours 255-3000)		FT. RUCKER SAFETY	

APPENDIX B

CASE NUMBER: \_\_\_\_\_

DATE: \_\_\_\_\_

CSSC-ID CAI INITIAL PRAM NOTIFICATION INFORMATION (GROUND ACCIDENT)

1. CLASSIFICATION: CLASS A: \_\_\_\_\_ CLASS B: \_\_\_\_\_ CLASS C: \_\_\_\_\_ OTHER (Specify): \_\_\_\_\_

2. DATE OF ACCIDENT: \_\_\_\_\_ TIME: \_\_\_\_\_ ON-DUTY: \_\_\_\_\_ OFF-DUTY: \_\_\_\_\_  
 TIME/DATE RECEIVED BY OPERATIONS: \_\_\_\_\_

3. TYPE EQUIPMENT INVOLVED: \_\_\_\_\_ MISSION: \_\_\_\_\_

4. UNIT: \_\_\_\_\_ MACON: \_\_\_\_\_

5. LOCATION OF ACCIDENT: \_\_\_\_\_ NVG: \_\_\_\_\_

6. POC: \_\_\_\_\_ POSITION: CDR: \_\_\_\_\_ SAFETY TECH: \_\_\_\_\_ OTHER: \_\_\_\_\_  
 TELEPHONE: AV: \_\_\_\_\_ COMMERCIAL: ( ) \_\_\_\_\_

7. HAZARDOUS/SENSITIVE MAT INVOLVED: YES: \_\_\_\_\_ NO: \_\_\_\_\_ SITE SECURE: YES: \_\_\_\_\_ NO: \_\_\_\_\_

8. WEATHER AT TIME OF ACCIDENT: \_\_\_\_\_ DAY: \_\_\_\_\_ NIGHT: \_\_\_\_\_

9. TOTAL NUMBER PEOPLE INVOLVED: \_\_\_\_\_ OFF: \_\_\_\_\_ WO: \_\_\_\_\_ EM: \_\_\_\_\_ CIV: \_\_\_\_\_ OTHER: \_\_\_\_\_  
 HIGHEST RANK INVOLVED: \_\_\_\_\_ NUMBER OF INJURIES: \_\_\_\_\_ FATALITIES: \_\_\_\_\_

THE FOLLOWING INFORMATION IS FOR INTERNAL SAFETY CENTER USE ONLY!!!

10. BRIEF SYNOPSIS OF ACCIDENT:

11. TEAM DISPATCHED: YES: \_\_\_\_\_ NO: \_\_\_\_\_ TEAM: \_\_\_\_\_

12. NEAREST AIRFIELD THAT CAN HANDLE C-12: \_\_\_\_\_

13. NEAREST COMMERCIAL AIRFIELD: \_\_\_\_\_

DISTRIBUTION:

CSSC -Z CSSC -DA (3)

-ZD -M (2)

-XO -ME

-ZM -ZJA

-ZSM -ZPA

-PPPD -ZNG

-S -DA (Gill)

-SPG -ZI

-SE (2) -ZID

OPNS FILE (2)

BOARD PRESIDENT & MEMBERS

NOTIFICATION:

After Duty Hrs

See SDO Roster

(225-7293) HRS

(786-6194/6121) TACOM

(284-9475/9340) AMC

(291-2800/3262) AFIP

MACON

TRADOC SCHOOL

## APPENDIX C

### AVIATION POINT OF CONTACT CHECKLIST

- \_\_\_ 1. Orders appointing investigation board.
- \_\_\_ 2. Blood/urine samples/tissue samples.
- \_\_\_ 3. Witness information: Name, rank, telephone number; summaries.
- \_\_\_ 4. Secure work area with access to commercial/AUOTVON telephone.
- \_\_\_ 5. PRAM/CID/MP reports.
- \_\_\_ 6. Individual flight records.
- \_\_\_ 7. Individual medical records/autopsy results if AFIP personnel.
- \_\_\_ 8. Individual personnel record(s) (field 201).
- \_\_\_ 9. ECOD.
- \_\_\_ 10. Typist, typewriter.
- \_\_\_ 12. Transportation: air and/or ground.
- \_\_\_ 13. Name and location of flight surgeon, bodies, injured, AFIP personnel.
- \_\_\_ 14. Weather statement (signed by forecaster).
- \_\_\_ 15. Unit and parent organization SOPS to include:
  - \_\_\_ a. Training.
  - \_\_\_ b. Administrative.
  - \_\_\_ c. Maintenance.
  - \_\_\_ d. Shop standards.
  - \_\_\_ e. Crew rest.
  - \_\_\_ f. Safety.
  - \_\_\_ g. Crew selection.
- \_\_\_ 16. Directive/policy letters/supplements to regulations that pertain to:
  - \_\_\_ a. That particular operation.
  - \_\_\_ b. Assignment of tasks/missions.
  - \_\_\_ c. AR 95-1.
  - \_\_\_ d. Field manuals/training circulars.
- \_\_\_ 17. Safety meeting minutes/council meeting minutes (if applicable).
- \_\_\_ 18. Individual training folders (ATM).
- \_\_\_ 19. 1:50,000 map which includes location of accident site.
- \_\_\_ 20. Survey of mishap site/wreckage.
- \_\_\_ 21. UICs/office symbols and chain of command addresses from unit through MACOM.
- \_\_\_ 22. Name, grade, title of safety officer, and address to send report.
- \_\_\_ 23. Collateral officer's name, address, and telephone number.
- \_\_\_ 24. Post wiring diagram (organization chart).
- \_\_\_ 25. ATC tapes (from initial contact through -1 hours).
- \_\_\_ 26. Unit preaccident plan.
- \_\_\_ 27. Statement of nonavailability (if applicable).
- \_\_\_ 28. PIO POC and telephone number.
- \_\_\_ 29. Inbrief/outbrief information.
- \_\_\_ 30. Recovery team.
- \_\_\_ 31. Release letter.
- \_\_\_ 32. Inventory of aircraft.

MAINTENANCE --- OPERATIONS

- 1. Aircraft logbook.
  - a. DA Form 2408-5
  - b. DA Form 2408-12
  - c. DA Form 2408-13
  - d. DA Form 2408-14
  - e. DD Form 365-4 or 365F.
- 2. Historical records.
  - a. Six-month file (DA Form 2408-13).
  - b. DA Forms 2408-15, 16, 17, 18.
  - c. Oil analysis records.
  - d. DA Forms 2404 retained on file.
  - e. DA Forms 2407- Maintenance Workorders
- 3. Equipment Improvement Report.
  - a. Oil analysis records and samples sent.
  - b. Fuel analysis.
- 4. -10 Operators Manual.
- 5. Checklist.
- 6. ATM.
- 7. -10 Organizational Maintenance Manual.
- 8. Parts "P" Manual.
- 9. Monthly Maintenance Report.
- 10. Operations Information.
  - a. PPC.
  - b. Briefing forms/data.
  - c. Flight plan.

## GROUND POINT OF CONTACT CHECKLIST

- \_\_\_ 1. Orders appointing investigation board.
- \_\_\_ 2. Blood/urine samples (Ask that the command test those involved in the accident.)
- \_\_\_ 3. Witness information: name, rank, telephone number, summaries.
- \_\_\_ 4. Secure work area with access to commercial/AUTOVON telephones.
- \_\_\_ 5. SIR, ROSA, MP, CID reports.
- \_\_\_ 6. Individual personnel record(s) (field 201).
- \_\_\_ 7. ECOD.
- \_\_\_ 8. Individual medical records.
- \_\_\_ 9. Typist, typewriter.
- \_\_\_ 10. Photo lab support (color, wide angle, telephoto, micro/macro).
- \_\_\_ 11. Location and name of doctor conducting autopsy. (Request a doctor on the board be a part of the autopsy).
- \_\_\_ 12. Weather statement (signed by forecaster).
- \_\_\_ 13. Aircraft arrangements for overhead photos.
- \_\_\_ 14. Unit and parent organization SOPs to include:
  - \_\_\_ a. Training.
  - \_\_\_ b. Administrative.
  - \_\_\_ c. Maintenance.
  - \_\_\_ d. Shop Standards.
- \_\_\_ 15. Directives that pertain to:
  - \_\_\_ a. That particular operation.
  - \_\_\_ b. Assigned tasks.
- \_\_\_ 16. Training folders (individual, unit).
- \_\_\_ 17. Individual counseling records.
- \_\_\_ 18. Individual SF 46.
- \_\_\_ 19. Individual 348.
- \_\_\_ 20. 1:50,000 map which includes accident site.
- \_\_\_ 21. UICs/office symbols and chain of command to MACOM.
- \_\_\_ 22. Local report number.
- \_\_\_ 23. Name, grade, title of safety manager, and address to send report.

## MAINTENANCE RECORDS

- \_\_\_ 1. DA Form 2404, Daily Inspection Worksheet
- \_\_\_ 2. DA Form 2404 retained on file (quarterly/semi-annually).
- \_\_\_ 3. DA Form 2404, Deferred Maintenance Worksheet.
- \_\_\_ 4. DA Form 2407, Maintenance Work Orders.
- \_\_\_ 5. DA Form 2408-20, Oil Analysis Record.
- \_\_\_ 6. DA Form 314, Preventive Maintenance Record.
- \_\_\_ 7. DA Form 2406, Materiel Condition Status Report.
- \_\_\_ 8. Calibration Records.
- \_\_\_ 9. Dispatch (1970).
- \_\_\_ 10. Dispatch log (2401).
- \_\_\_ 11. Equipment logbook.
- \_\_\_ 12. -10 Operator's Manual.
- \_\_\_ 13. -20 Organizational Maintenance Manual.
- \_\_\_ 14. "P" Parts Manual.

APPENDIX D

INVESTIGATION TEAM DEPLOYMENT BRIEFING

ACCIDENT LOCATION

ACCIDENT TIME

TYPE EQUIPMENT

SUMMARY OF ACCIDENT

TYPE OF TRANSPORTATION

LOCATION OF DEPARTURE

TIME OF DEPARTURE

DESTINATION CITY

SPECIAL CLOTHING/UNIFORMS REQUIRED

PICK UP TDY ORDERS (WHEN, WHERE)

REQ EQUIP:                      CONFIRMED BY PRESIDENT                      RECORDER                      SFTY SPEC

FILM

CAMERA

RECORDING TAPE

SPECIAL TOOLS

INVES WORKBOOKS

TAPE REC W/BATTERIES

TRANS W/EAPHONE AND PEDAL

FORMS/RECORDS

REFERENCES

CELLULAR PHONE

COMPOSITE MATERIAL INVESTIGATION KIT

CHEMICAL EVENT INVESTIGATION DEPLOYMENT KIT

PASSPORT (IF REQUIRED)

INITIAL NOTIFICATION INFORMATION FORMS

CALLING CARD

CRITIQUE SHEET

SIGN-OUT (DA FORM 647-1)

CAR RENTAL RESPONSIBILITIES

WORK GROUP ASSIGNMENTS

APPENDIX E

\*INITIAL BOARD BRIEFING

Introductions (Office/Phone #)

Ensure Board is Qualified (AR 385-40, para 5-13,d) (Need Maint Off/Maint Tech)

Explain That They Are Dedicated to the Investigation

Explain Investigative Mission:

Accident Prevention Only

Human/Materiel/Environmental Causes

Approximate Duration of Investigation

Recap Date/Time/Summary of Accident

Explain Task Errors/System Inadequacies (Briefly)

Review DA Pam 385-95

Review Investigation Workbook/Handbook

Explain Data Collection Phase, page 2-13

Assign Work Groups/Leaders:

Human Factors, page 2-22

Materiel Factors, page 2-36

Explain Deliberation Phase, pg 3-2

Explain Report Preparation

Assign Responsibility for Report Sections:

History of Flight/Events

Narrative

Analysis

Findings/Recommendations

2397 Series, pg 2-8 (Aviation Only)

Establish a Daily Meeting Time to Exchange Information - Work Hours

Allow Work Groups Organization Time

Discuss release of information outside board

Discuss work relationship with the collateral investigation board

\*Reference DA Pam 385-95, para 2-3.



## APPENDIX F

### COURTESY IN-BRIEF TO COMMANDER - OUTLINE

1. Introductions.
2. Office phone number where board can be reached.
3. Briefly explain the investigation board's mission.
  - a. Accident prevention only.
  - b. Human/materiel/enviromental causes.
  - c. Present but not contributing factors.
  - d. Approximate duration of field investigation and when the commander can expect the exit report and the final written report.
4. Explain what services/equipment/personnel/facilities you need to perform the field investigation.
5. Inform commander that an outbriefing will be conducted prior to your departure, an exit report will be left, and that the board will contact him for a time/place.
6. KEEP COMMANDERS INFORMED THROUGHOUT THE INVESTIGATION.
7. \*A courtesy in-brief to the chain of command (battalion/ brigade commanders) should be conducted as soon as possible after coordinating with the unit POC. Depending on the situation, this in-brief can be accomplished face to face or telephonically. The primary purpose is to explain the board's mission and to assure the commander that he will be kept informed. This action should be accomplished as soon as board in convened.

# APPENDIX G

## SUGGESTED ASSIGNMENTS

### Responsible Individuals

R - Recorder  
BP - Board President  
MF - Materiel Factors  
HF - Human Factors  
ALL - All Board Members

DA Pam 385-95 Form Numbers

Class- ification		2397															
Type Occurrence		-R	-1	-R-2	-R-3	-R-4	-R-5	-R-6	-R-7	-R-8	-R-9	-R-10	-R-11	-R-12	-R-13	-R-14	-R
A	Aircraft Accident	X	X	X	X	X	X	Y	Y	Y	X	Y	X	X	Y	X	X
	Ground Accident	X	X	X	X	X	Y	Y	Y	X	Y	Y	Y	Y	Y	X	X
B	Aircraft Accident	X	X	X	X	X	Y	Y	Y	X	Y	X	X	Y	X	X	X
	Ground Accident	X	X	X	X	X	Y	Y	Y	X	Y	Y	Y	Y	Y	X	X
C	Aircraft Accident	X	X	X	X	X	Y	Y	Y	X	Y	X	X	Y	X	X	X
	Ground Accident	X	X	X	X	X	Y	Y	Y	X	Y	Y	Y	Y	Y	X	X

X - Form is mandatory if a DA Form 2397 series Technical Report is required by AR 385-40.

Y - Form requirement is determined by criteria in chapter 8, DA Pam 385-95.

### DA FORM 2397-3 (NARRATIVE ASSIGNMENTS)

1. Board President: a. History of Flight  
b. Command  
c. Analysis
2. Human Factors: Subparagraphs 1-12 of paragraph 8-7b(1) (b), DA Pam 385-95 except Item No. 3.
3. Materiel Factors: All of paragraph 8-7b(1) (c), DA Pam 385-95.

## APPENDIX H

## TECHNICAL REPORT OF U.S. ARMY ACCIDENT

Index	<b>A</b>	Case Number	YR	MO	DA	CASE #
		e.g.	80	06	10	001
Tab	Information					
1	Serious Incident Report/Casualty Report/Report of Serious Accident					
2	Investigation Board Orders					
3	Map of Accident Site					
4	Photographs					
	(The above will always be included, in order. The following may be included, depending on the type of accident. They are to be included in the order shown [if applicable], and listed numerically after Tab 4.)					
	Certificate of Damage					
	Technical Inspection					
	DA Form 2404					
	Directives, Regulations, etc.					
	OF 46					
	DA Form 348					
	Unit Training Schedule					
	Laboratory Analysis					
<b>Remarks:</b> Range Control Log MEDEVAC Report Weather Data Seating Diagram Police Report Accident Sequence Time Chart Medical Information Autopsy Protocol Any additional information peculiar to type of accident						

# TECHNICAL REPORT OF U.S. ARMY ACCIDENT

USASC Form 5-84

## APPENDIX I

### INITIAL CRASH SITE ACTIONS

1. Remain outside secured area until site photography is completed and cleared into area by board president or materiel factors group leader.
2. Do not move (or touch) any item (parts, pieces, controls, etc.) or disturb ground scars or marks until properly documented and until the site is released by the investigator in charge.
3. Systematically record instrument readings, control positions, switch positions, avionics equipment settings as soon as possible.
4. Systematically inventory aircraft parts/components to determine if all are accounted for.
5. Determine if post engineer support is required for wreckage distribution diagram preparation.
6. Following the board's viewing of the accident site, data collection will continue as directed by the work group leaders.
7. Keep an open mind; don't speculate or draw conclusions. Gather facts and data, then analyze.
8. Utilize instrument work sheet on next page.

# INSTRUMENT/CONTROL SETTINGS WORKSHEET

ITEM	POSITION/SETTING	REMARKS
<b>A. Flight Controls</b>		
1. Cyclic/Yoke		
2. Throttle/Quadrant		
3. Collective		
4. Flaps		
5. Landing Gear		
<b>B. Flight Instruments</b>		
1. Airspeed		
2. Vertical Speed		
3. RMI		
4. Magnetic Compass		
5. Altimeter (Altitude)		
6. Altimeter (Kolsman Window)		
<b>C. Engine Instruments (List)</b>		
1.		
2.		
3.		
4.		
5.		
<b>D. Avionics (Navigation)</b>		
1. ADF #1		
2. ADF #2		
3. Marker Beacon		
4. VOR/ILS		
<b>E. Avionics (Communications)</b>		
1. VHF #1		

2. VHF #2

3. UHF #1

4. UHF #2

5. FM #1

6. FM #2

F. Avionics (Miscellaneous)

1. Radar Altimeter

2. Autopilot

3.

4.

G. Miscellaneous (i.e., Switches)

1. Fuel Switch

2. External Lights

3. Internal Lights

4.

5.

## APPENDIX J

### GROUND NARRATIVE OUTLINE

1. HISTORY OF EVENTS:
  - a. Preaccident phase.
  - b. Accident phase.
  - c. Postaccident phase.
2. HUMAN FACTORS INVESTIGATION:
  - a. Personnel background information.
  - b. Personnel management.
  - c. Command.
  - d. Vehicle/system/equipment suitability.
  - e. Communications.
  - f. Environmental conditions.
  - g. Support services.
  - h. Accident survivability.
  - i. Rescue operations.
  - j. Accident site information.
  - k. Special investigation.
  - l. Witness investigation.
3. MATERIEL FACTORS INVESTIGATION:
  - a. Vehicle/system/equipment worthiness.
  - b. Systems.
    - (1) Engine.
    - (2) Transmission.
    - (3) Steering/control.
    - (4) Brake.
    - (5) Fuel.
    - (6) Electrical.
    - (7) Hydraulic.
    - (8) Frame.
    - (9) Suspension.
    - (10) Tires.
    - (11) Weapons.
  - c. Laboratory analysis (if applicable).
  - d. Fire (if applicable).
  - e. Parachutes (if applicable).
  - f. Explosives (if applicable).
4. ANALYSIS. (See Appendixes L and M)

## APPENDIX J



Discuss each item in narrative form. Don't just answer the question. Do not restate the question. Discuss only those items applicable to the type accident.

If a paragraph does not apply (i.e., shooting instead of vehicle) use the standard statement: Not a causal factor in this accident (or N/A).

1. HISTORY OF EVENTS:

a. Preaccident Phase (Use tabs to amplify).

- (1) State the mission.
- (2) Discuss the purpose of the mission.
- (3) Who tasked the unit/individual with the mission?
- (4) Identify the individual that authorized the mission.
- (5) Identify the personnel involved in the mission (include

SSN).

- (a) Duty assigned.
- (b) Personnel position.
- (c) How/when were they informed of the mission.

(6) Discuss mission preparations. Include:

- (a) Premission planning.
- (b) Orders.
- (c) Briefings.
- (d) Equipment inspections.
- (e) Dispatching of vehicles/systems/equipment.
- (f) Identify equipment--include serial/lot numbers.

(7) Was there a sense of urgency associated with the mission?

(8) Were there any delays prior to vehicle departure?

(9) Elaborate on mission sequence of events to the time of the accident. Include:

- (a) Wake-up times.
- (b) Meal times (if appropriate).
- (c) Workday termination times.
- (d) Departure times.
- (e) Identification of element involved in accident.
- (f) Accident location (grid, post, road, etc.).

b. Accident Phase.

(1) Time the vehicle/system/equipment departed on the mission.

(2) Describe any emergency encountered - sequence of events leading to and including the accident.

- (a) When it started.
- (b) What was done.
- (c) Consequences.
- (d) Symptoms.
- (e) Warnings.
- (f) Actions/reactions of personnel or equipment.

(3) Time of the accident.

c. Post accident Phase.

- (1) Injuries sustained in the accident.
  - (a) Location of personnel/equipment at the conclusion of the accident.
  - (b) Summary of individual injuries.
- (2) Condition of the vehicle/system/equipment, i.e., overturned, engine still running.
- (3) Reactions of personnel/equipment after the accident. Include who discovered the accident victim(s).
- (4) Summarize how the victim(s) were evacuated and survival/rescue.
- (5) Rescue and first aid efforts.
  - (a) Who gave first aid/CPR. If neither were administered, determine why.
  - (b) MEDEVAC/ambulance.
    - (1) Who called the MEDEVAC/ambulance and when?
    - (2) Time of arrival on the scene.
    - (3) Were first aid/rescue efforts continued enroute to the hospital?
    - (4) Was more than one MEDEVAC/ambulance utilized - why?
    - (5) Time of arrival of the patient(s) at the hospital and explanation of any en route delays.
    - (6) Condition/status of patient(s) at hospital - time of death (if applicable).
    - (7) Identify all medical facilities that provided treatment.

## 2. HUMAN FACTORS INVESTIGATION.

a. Personnel Background Information. (On personnel directly involved with the accident). Summarize background and qualifications on anyone associated with or who may have played a part in the accident (those who made, caused or contributed to the errors), i.e., commanders, operations personnel, passengers, etc.

- (1) Brief personal history.
  - (a) Date and place of birth.
  - (b) Civil schools, i.e., high school, college, trade school, this with dates of completion (only if it has a bearing on particular accident).
  - (c) Civil work/employment (only if it has a bearing on this particular accident).
  - (d) When they entered the service (if applicable).
- (2) Brief military history (if applicable). Include:
  - (a) Time of entry until assigned to present unit.
  - (b) Training/MOS assignment, qualifications, and current promotion.
  - (c) Schools attended and completion dates.
- (3) Describe each person's qualifications and readiness to perform the mission.
- (4) Was the operator qualified?
- (5) Explain any irregularities.
- (6) Experience level with vehicle/system/equipment.
- (7) Briefly discuss the person's professional reputation in

unit using opinions of peers, subordinates, supervisors and others who have worked with them.

(8) Background report. Include:

- violations.
- (a) Evidence of vehicle/system/equipment safety violations.
  - (b) Evaluation boards, i.e., re-up, psychiatric, promotion, etc.  
(if applicable to accident).
  - (c) History of prior violations or accident involvement - explain.
  - (d) Physically qualified to do the job.

(9) Explain irregularities. If none, so state. Include:

- (a) Social habits.
- (b) Financial status.
- (c) Marital well-being.
- (d) Off-duty schooling.
- (e) Recreational habits.
- (f) Sleep/dietary habits.
- (g) Disciplinary actions and awards (if applicable).

(10) Medical information. Discuss:

- have
- (a) The individual's medical history. Include medical abnormalities (psychological or physiological) which may have impaired their actions.
  - (b) Determine the date of his/her last physical examination.
  - (c) Are they on any type of medication? If so, what type, source, side effects, dosage, and effects it may have on performance.
  - (d) Determine the blood/alcohol level.
  - (e) Drug screen - urine samples must be sent to a contract hospital or AFIP for testing. Include statement of results.

(f) Injury/fatality information.

- caused
- were
- (1) Were injuries related to vehicle/system/equipment survivability?
  - (2) Were problems associated with escape - survival - rescue?
  - (3) Explain how the individual was injured (what the injury) and what the injuries were.
  - (4) How long will the individual be hospitalized?
  - (5) Fatality - explain fatal injuries and how they were caused.
  - (6) Summarize the autopsy report to explain fatal injuries.

b. Personnel management.

(1) How did the unit manage/use the individuals who caused, contributed, or who was a victim of the accident?

(2) Begin with the date of assignment to current unit.

(a) Review:

- (1) Experience upon assignment.
- (2) Qualifications upon assignment.

- (b) Report how individual was:
    - (1) Tasked.
    - (2) Trained.
    - (3) Managed up to the date of the accident.
  - (c) Discuss additional duties; percent of time given time given to primary duty.
  - (d) Report qualifications acquired since assignment.
  - (e) Review procedures involved with mission crew/personnel selection.
    - (1) Evaluate timeliness of notification.
    - (2) Personnel/mission compatibility.
    - (3) Experience of individuals.
  - (f) Evaluate fatigue factors which may have had an effect the mission.
  - (g) Review unit sleep/work plan.
    - (1) In effect?
    - (2) Being monitored?
    - (3) Being complied with?
- c. Command.
  - (1) Discuss command policies/procedures having an influence the accident. Include:
    - (a) Rationale for policy.
    - (b) Rationale for procedures.
    - (c) Adequacy.
    - (d) Method of dissemination.
    - (e) Ease/difficulty of interpretation.
    - (f) Measures to ensure compliance.
- d. Vehicle/system/equipment suitability.
  - (1) Discuss suitability of accident vehicle/system/equipment perform the mission.
  - (2) Primary purpose of vehicle/system/equipment.
  - (3) Design limitations of vehicle/system/equipment as found applicable operators manuals.
  - (4) Brief description of condition of vehicle/system/equipment and if use exceeded its limitations.
- e. Communications.
  - (1) Discuss evidence relating to:
    - (a) Commo equipment (visual or electronic signals, etc.).
    - (b) Commo occurring:
      - (1) Among the crew/personnel.
      - (2) Between the crew/individuals and passengers.
      - (3) Between the crew/individuals and outside services, i.e., operations, command and control.
      - (4) Agency-to-agency/service-to-service.
    - (c) Language difficulties.
    - (d) Clarity of verbal/written communications.
    - (e) Time delays and reasons for delays.
    - (f) Communications adequacy.
- f. Environmental Conditions.
  - (1) Weather:

accident (a) Weather conditions prevailing at the time of the  
(include previous weather conditions, if  
applicable) and where obtained.  
and (b) Applicable sky conditions, visibility, winds (surface  
altitude), and contributing conditions such as rain,  
snow, smoke, etc.  
terms (c) Paragraph should be written in easy to understand  
and not in aviations terms.  
(d) If mission involved night operations, details of  
available illumination should be added if it applied to  
the accident.

(e) For parachute accidents. Determine:

1 Winds aloft (drop altitude).

2 Surface winds.

(2) Other Than Weather. Evaluate other factors which may have  
been present. Examples are given below:

(a) Dust/obscurants.

(b) Night vision.

(c) Heat/cold.

(d) Surface/terrain conditions.

g. Support Services.

(1) Ground.

i.e., (a) Discuss evidence which relates to role in accident,  
etc. ground guides, road guards, traffic signs/signals,

(b) Dispatch procedures, if applicable.

(2) Air. Aircraft.

h. Accident Survivability.

(1) Accident survivability of vehicle/system/equipment in  
terms of accident sequence, impact conditions, accident  
forces.

(a) Occupant injury relationship to survivability.

(b) Restraint systems/rollbar protection (use/nonuse of)  
(equipped/nonequipped).

(c) Protection clothing/equipment.

(d) Backup/emergency systems (reserve parachute).

(2) Design of vehicle/system/equipment.

i. Rescue Operations.

(1) Describe factors that may have enhanced or inhibited the  
success of the survival/rescue situation.

(2) Describe the individual's location.

(3) How did they exit and any difficulties encountered.

(4) Position of the vehicle/system/equipment at the time of  
egress.

(5) How and when MEDEVAC was requested and if needed.

(6) Times of response, pickup and delivery of the victim(s).

(7) Type/methods of first aid and CPR treatment prior to and  
during MEDEVAC.

j. Accident Site Information. Fully describe the accident site  
and any peculiarities found. Note whether the site was preserved.

k. Special Investigation. Report the results of any special investigation conducted, i.e., so many like vehicles were checked for similar problems on the same installation, special tests or studies conducted by other agencies (private, government) for the board.

1. Witness Investigation.

- (1) Briefly indicate the number of witnesses interviewed.
- (2) Identify each by duty position.
- (3) Indicate whether or not witnesses generally agree.
- (4) Discuss conflicts.
- (5) Discuss credibility.

3. MATERIEL FACTORS INVESTIGATION. Describe fully the factual observations made by the materiel factors work group. Refer to wreckage distribution diagram, photos, other diagrams, records, reports and technical publications. Describe whether damage was a result of normal operations or the accident.

a. Vehicle/System/Equipment Worthiness.

(1) Investigation should include, but not be limited to, a complete technical inspection, covering such areas as:

- (a) Maintenance records.
- (b) Historical records.
- (c) Interviews with maintenance personnel.
- (d) Operator prevention maintenance.

(e) Dispatch records.

(2) Discuss all recorded and unrecorded faults that had a role in the accident.

(3) Discuss those technical publications not complied with or found inadequate. Indicate technical reference manuals (dates of the manual, chapter/page, etc., include manual extracts).

b. Systems. Note all discrepancies and their effect on the operation of the vehicle/system/equipment. Use photographs to report evidence obtained in the examination of the following:

- (1) Engine.
- (2) Transmission.
- (3) Steering/control.
- (4) Brake.
- (5) Fuel.
- (6) Electrical.
- (7) Hydraulic.
- (8) Frame.
- (9) Suspension.
- (10) Tires.
- (11) Weapons.

c. Laboratory analysis.

- (1) Report results of laboratory tests.
- (2) If a teardown analysis of materiel has been completed, report the results in this paragraph.

d. Fire.

- (1) When did it occur?
- (2) How was it detected?
- (3) Ignition source.
- (4) Combustible material.

- (5) Location.
- (6) Propagation.
- (7) Attempts to extinguish.

e. Parachutes.

- (1) Harness.
- (2) Pull tests.
  - (a) Ripcord grip-stow pocket (free-fall jumps).
  - (b) Canopy deployment.
- (3) Risers (suspension lines).
- (4) Main canopy.
- (5) Pilot chute (if applicable).
- (6) Reserve.

4. ANALYSIS. (See Appendixes L and M)

NOTE: For deliberation procedures, see Chapter 3.

## APPENDIX K

### AIRCRAFT NARRATIVE OUTLINE

1. History of Flight.
  - a. Preflight phase
  - b. Flight phase
  - c. Postflight phase
2. Human Factors Investigation.
  - a. Personnel background information
  - b. Personnel management
  - c. Command
  - d. Aircraft suitability
  - e. Communications/air traffic control
  - f. Navigational aids
  - g. Meteorological information
  - h. Ground support services
  - i. Crashworthiness
  - j. Personnel egress, survival and rescue
  - k. Special investigation
  - l. Witness investigation
3. Materiel Factors Investigation.
  - a. Aircraft airworthiness
  - b. Flight data recorders
  - c. Airframe
  - d. Systems
  - e. Power plant
  - f. Rotor system or propeller
  - g. Transmission/gearboxes and drive train
  - h. Electromagnetic environmental effects
  - i. Laboratory analysis
  - j. Accident site information
  - k. Fire
4. Analysis. (See Appendixes L and M)

NOTE: A more detailed outline of the narrative items above is continued on the following pages.



Discuss each item in narrative form. Don't just answer the questions. Discuss only those items applicable to the type accident. If a paragraph does not apply, use N/A to so note.

## 1. History of Flight.

### a. Preflight phase.

- (1) What was the type of mission?
- (2) What was the purpose of the mission?
- (3) How did the unit become tasked with the mission?
- (4) Who or what activity authorized the mission?
- (5) Identify the crewmembers selected for the mission.
  - (a) Duty assigned.
  - (b) Crewmember station.
  - (c) How/when/where they were informed of the mission.
- (6) What action did crewmembers take in mission preparation?
  - (a) Preflight planning (Wx, fuel, PPC, etc.).
  - (b) Weight and balance determinations.
  - (c) Briefings.
  - (d) Filing.
  - (e) Inspecting aircraft.
  - (f) Etc.
- (7) Was there a sense of urgency associated with the mission?
- (8) Were there delays prior to the flight's departure?

### b. Flight phase.

- (1) When did the aircraft depart on the mission?
- (2) Chronologize each routine flight segment and ground stop, any, prior to the accident flight segment.
- if (3) If accident segment contained an in-flight emergency, describe the event in detail to include:
  - (a) Onset
  - (b) When it occurred
  - (c) Symptoms
  - (d) Warnings
  - (e) Instrument readings
  - \* (f) Actions/reactions of aircraft
  - \* (g) Actions/reactions of crewmembers from onset until aircraft is at rest at the conclusion of the flight.

### c. Postflight phase.

- after (1) Brief description of condition of aircraft immediately accident.
- after (2) Brief description of condition of occupants immediately accident.

(Reserve details for those parts of the report that are applicable.)

- (3) If postcrash fire, explain.
- (4) How/when was the fire extinguished.
- (5) Summarize \_\_\_\_\_ occupants' egress.
- (6) Summarize \_\_\_\_\_ search and rescue efforts.

(Reserve details of egress, search and rescue for parts of report that are applicable.)

Ref. DA Pam 385-95, para 8-7.

## 2. Human Factors Investigation.

a. Personnel background information.

- (1) Describe each aviator crewmember's aviation qualifications and readiness to perform the mission.
- (2) Was he qualified and current in the MTDS used?
- (3) Explain any irregularities in the training folder, i.e.,
  - (a) Accomplished minimums?
  - (b) Annual writ?
  - (c) Instrument renewal?
- (4) Indicate also if requirements were met and when.
- (5) If postaccident evaluation was given, summarize results.
- (6) Highlight weaknesses in proficiency, if appropriate.  
(Emphasis on those tasks duplicating those involved in accident)
- (7) Describe experience in mission aircraft.
- (8) Initial qualification.
- (9) Total time.
- (10) Flight time last 3 months.
- (11) Background report; include:
  - (a) Evidence of flight safety violations.
  - (b) Flight evaluation boards.
  - (c) History of prior accident involvement. Explain role.
- (12) Were aviator crewmembers physically qualified?
- (13) Discuss currentness of flight physical.
- (14) Waivers, other medical irregularities, explain.
- (15) Professional reputation in unit, opinions of peers, subordinates, and others who have flown with them, etc.
- (16) Review:
  - (a) Social habits
  - (b) Financial status
  - (c) Marital well-being
  - (d) Sleep/dietary habits
  - (e) Off-duty schooling
  - (f) Recreational activities  
(Explain irregularities. If none, so state.)
- (17) Medication; was an aviator crewmember receiving any?  
Prior to accident? If so, report:
  - (a) Type
  - (b) Source
  - (c) Dosage
  - (d) Side effects
  - (e) Possible effects on performance
- (18) Fatality? Summarize autopsy report, AFIP tissue specimen and other analysis results available.  
(Explain irregularities.)
- (19) Injuries? Summarize in terms of body aspect, causative agent, etc.
  - (a) Were injuries related to aircraft crashworthiness?
  - (b) Were problems associated with:
    - (1) Escape
    - (2) Survival
    - (3) Rescue  
(Make brief comments on this part of narrative detail in specific sections devoted to these phases.)

(20) Nonrated/passenger occupants

- observer, (a) Was nonrated/passenger at controls' or aerial  
or other cause-related role?  
(b) Summarize background and qualifications.  
personnel \* (c) Summarize background and qualifications of any  
not aboard the aircraft if they played a  
part, i.e.,

- (1) Commanders
- (2) Operations personnel
- (3) ATC personnel
- (4) Weather personnel
- (5) Maintenance personnel
- (6) Others, as applicable

\*Extremely important. Use all resources to obtain.

b. Personnel management.

- (1) How did unit manage each individual involved in accident?
- (2) Begin with date of assignment to current unit.

(a) Review:

- (1) Experience upon assignment.
- (2) Qualifications upon assignment.

(b) Report how individual was:

- (1) Tasked
- (2) Trained
- (3) Managed to date of accident.

(c) Discuss additional duties; percent of time given  
time given to primary duty.

(d) Report qualifications acquired since assignment:

- (1) Checkouts in additional aircraft.
- (2) Appointments:

- (a) IP
- (b) SIP
- (c) IFE
- (d) PIC
- (e) UT
- (f) Etc.

versus  
selection. (e) Review procedures involved with mission crew

- (1) Evaluate timeliness of notification.
- (2) Crew/mission compatibility.
- (3) Relative flight experience of pilots (if more than one)
- (f) Review unit crew rest policy.
  - (1) In effect?
  - (2) Being monitored?
  - (3) Being complied with?

c. Command. Discuss command policies/procedures having an  
influence on accident. Include:

- (1) Rationale for policy.
- (2) Rationale for procedures.

(3) Adequacy.

- (4) Method of dissemination.
- (5) Ease/difficulty of interpretation.
- (6) Measures to ensure compliance.

d. Aircraft suitability.

(1) Discuss suitability of accident aircraft to perform mission.

(2) Consider:

(a) Flight and navigational instrumentation regarding prevailing weather.

(b) Fuel consumption relative to range.

(c) Power available relative to:

(1) Gross weight.

(2) Density altitude.

(3) Aircraft design limitations (IAW -10)

(Configurations, etc.)

e. Communications/air traffic services. Discuss evidence relating to:

(1) Commo equipment (visual/electronic signals, etc.)

(2) Commo occurring:

(a) Among the crew.

(b) Between the crew and passengers.

(c) Between the crew and outside services; e.g.,

(1) ATC

(2) Operations

(3) FSS

(4) Command and control

(5) Miami Caribbean Trans Oceanic

(6) Pathfinders, etc.

(3) Consider language difficulties and:

(a) Understanding spoken word.

(b) Adequacy and precision of instruction, etc.

f. Navigational aids.

(1) Discuss adequacy of navigational aids to include:

(a) VOR

(b) NDB

(c) ILS, etc.

(2) Consider FAA or other agency involvement, NOTAMS, PIREPs, etc.

g. Meteorological information.

(1) Discuss weather conditions prevailing throughout mission.

(2) Include:

(a) Sky condition

(b) Visibility

(c) Winds

(d) Icing

(e) Turbulence

(f) Any significant weather conditions

(3) Consider weather observations by:

(a) Trained weather observers

(b) Witnesses in the area

(4) Discuss accuracy of forecast received by crew. If actual weather differed significantly from forecast, include discussion of information available to forecaster.

(5) If mission involved NVG operations, obtain details of moonglow, local resolution, etc.

h. Ground support services.

(1) Discuss evidence relating to ground support services in the accident.

(2) Consider:

(a) POL

(b) Ground guides

(c) Fire guards, etc.

i. Crashworthiness.

(1) Discuss evidence relating to crashworthiness.

(2) Include:

(a) Performance of restraint systems

(b) Aircraft structure

(1) Occupiable space

(2) Attenuation

(3) Seats

(3) Performance of personal protective equipment, i.e.,

(a) Helmet

(b) Visor

(c) Clothing, etc.

j. Personnel egress, survival and rescue

(1) Include:

(a) Ejection/bailout

(b) Survival/rescue

(2) Discuss difficulties encountered by survivors and rescuers.

(3) Include information on:

(a) Training

(b) Equipment used (type)

(c) Any failure/malfunction of equipment used

k. Equipment/workplace design

CONTROLS

Separation distance

Size of control(s)

Shape of control(s)

Lighting of control

Design

DISPLAYS

Ease of interpretation

Heads-up display symbology

Heads-up display location

Glare/reflecting or display

Display lighting

l. Special investigation.  
investigation conducted.

Reported results of any special

m. Witness investigation.

(1) Briefly indicate number of witnesses interviewed.

(2) Identify each by duty position.

(3) Indicate whether or not witnesses generally agree.

(4) Discuss credibility.

- (5) Include any desired witness summaries in the analysis paragraph.

### 3. Materiel Factors Investigation.

Describe fully the observations made by the materiel factors work group. Refer to wreckage distribution diagram, photographs, other diagrams, records, reports, and technical publications. All items will be addressed with P/N, NSN, full TM DATA, DATES, PAGES, FRAMES, ITEM, PARAGRAPH (as appropriate).

#### a. Aircraft airworthiness.

(1) Historical records. Examination should include an evaluation of all historical records to include weight and balance, MWOs, and safety-of-flight messages. Include aircraft serial number, unit of assignment, home station, and total flight time (airframe) hours at the time of the accident.

(2) Maintenance records. Examination should include an evaluation of the current maintenance records, to include all logbook forms, six-month file, and corrected/uncorrected faults. Particular attention should be spent on technical publications not complied with.

(3) Adequacy of preflight. Was an adequate preflight inspection conducted? Was the unit following standard maintenance procedures?

b. Flight recorders. Specify type and serial number. Discuss significant data recorded and its relation to the onset, corrective actions taken, and results of the emergency. List all instrument indications and switch positions below.

#### c. Airframe. Use subparagraphs to report evidence of:

(1) Present a brief description of the aircraft impact sequence from initial impact to final rest position. If major impact and initial impact are different, so state.

(2) Conditions of aircraft during impact and after impact. Include wreckage distribution, ground impact marks and distortion of aircraft to obtain a general picture of the probable attitude during impact and crash scenario.

NOTE: An inventory should be made for parts accountability.

(3) Landing gear/skids. Determine position of landing gear, compression stroke of gear, deformation of skids, and condition prior to mishap.

#### d. Systems. Report in subparagraphs evidence obtained:

(1) Fuel system. Discuss the ability of the crashworthy fuel system or its failure to retain fuel onboard at impact.

Break-away fittings should also be addressed.

(2) Warning system. Determine what warned the crew of the impending emergency and specify the particular systems activated at the time of the mishap sequence. Include lights on/off and gauge indications.

(3) Flight control system. Check all controls from cockpit to control surfaces for continuity and position. Of particular importance is the induced flight control movement due to

seemingly insignificant impacts. An example is an AH-1 which strikes a tree while "traveling" down a valley. The aircraft's right synchronized elevator struck a large tree branch. This caused the synchronized elevator to be pulled back into the tail rotor control tube resulting in a right pedal input. Qualify deformation by both degrees and linear measurement.

(4) Hydraulic system. Expand on the operation of the hydraulic system to include leakage, break-away fittings, and evidence of pre-mishap deficiencies.

(5) Electrical system. Check for the following:

(a) Availability of electrical power at the time of the mishap.

(b) Electrical fire.

(c) Proper or improper wiring.

(d) Lightning strike. If struck by lightning, trace path, check magnetic compass for induced field, check antennas, and verify radios operate properly.

(e) Check all primary lights and use filament examination to determine operation (if required).

(6) Stability augmentation, SCAS, autopilot. Determine its operation at the time of the mishap and potential roles it may have played.

(7) Night vision systems. Discuss operational status of system if it was a factor in the accident or was in use at the time of the accident.

(8) Armament system. Discuss status of the system and its contribution to the accident. If applicable, specify system in use, ammunition being used and its involvement.

(9) Other.

e. Power plant. Report evidence obtained during examination. Specifically:

(1) Check power plant for mounting (check tail rotor drive shaft).

(2) Evaluate all linkages.

(3) Check for evidence of overtemp, internal damage, i.e., molten metal in tail cone, oil leaking from exhaust, discoloration, damage to power turbines, etc.

(4) Obtain all serial numbers and locate all components.

(5) What was the engine's operation prior to the mishap?

(6) Check the fuel system for leaks, but ensure the engine's fuel filters are examined.

(7) Are turbine wheels free to turn?

(8) Examine and report on engine with regard to the compressor, combustion, turbine, exhaust, accessory, and fuel control sections.

f. Rotor system and propeller.

(1) Was the rotor or propeller under power at the time of the mishap? If so, how much (if possible)?

(2) Elaborate on all major blade or propeller strikes in relation to mishap sequence.

g. Transmission/gearboxes and drive train. Report evidence obtained during examination. List all discrepancies and their effect.

- (1) Check chip detectors and remove all screens.
- (2) Check for foreign material. Check all internal lubrication lines.
- (3) Check for mounting and fractures.

h. Electromagnetic environmental effects ( $E^3$ ). Check, within 5 miles, all RF emitters and their relation to the mishap aircraft. A diagram should be included as a Tab. Determine with systems assistance the RF emitters' effect upon the aircraft.

i. Laboratory analysis. Report results of:

- (1) Fuel, oil, hydraulic, chemical.
- (2) Teardown analysis, i.e., CCAD.

j. Accident site and airfield information. Discuss adequacy; include:

- (1) Location (i.e., grid coordinates and by reference to common features).
- (2) Dimensions.
- (3) Lighting/markings.
- (4) Obstructions.
- (5) Type of surface and condition, slopes, etc.

k. Fire. Discuss role of fire, to include:

- (1) When did it occur?
- (2) How was it detected?
- (3) Ignition source.
- (4) Combustible materials.
- (5) Location.
- (6) Propagation.
- (7) Attempts to extinguish.



## NARRATIVE SUPPORTIVE INFORMATION

A. General. The following checklists and worksheets are designed to assist you in conducting the investigation.

B. Human Factors Investigation

1. General Information, pages K16 thru K17
2. Crew Information Sheet, pages K18 AND K19
3. Chronological Account of Activities, page K20
4. Human Factors Work Group Leader Checklist, pages K21 thru K23

C. Materiel Factors Investigation

1. Materiel Checklists, pages K24 thru K28
2. Materiel Factors Work Group Leader Checklist, pages K29 and K30

## Human Factors Investigation.

### General Information

A. The human factors investigation work group is responsible for the identification of human factor data which relates to the accident sequence or accident personnel. The work group is normally composed of at least three people, the work group leader, a flight surgeon, and an instructor pilot. The first order of business for the work group leader is to review the work to be completed and to make general assignments of duties. The following duties are suggested assignments at the discretion of the group leader:

#### B. Work Group Leader

- (1) Conduct witness interviews.
- (2) Complete DA Form 2397-3-R, para 2, Human Factors Investigation Narrative.
- (3) Edit witness statements, but retain critical information.
- (4) Collect supporting documents as necessary.
- (5) Ensure human factors materials are turned in to the recorder.
- (6) Training failure.
- (7) Leader failure.
- (8) Standards failure.
- (9) design failure.
- (10) Individual failure.

#### C. Flight Surgeon

Conduct that portion of the investigation pertaining to the medical aspects of the human factors investigation, which will normally include the following:

- (1) Blood/urine analysis sample submitted to AFIP.
- (2) Review medical/dental records for significant entries.
- (3) Assist in or observe any autopsy, if possible
- (4) Conduct postaccident, medical/psychophysiological examination as necessary.
- (5) Review use and effects of survival/life support equipment.
- (6) Document survival equipment problems.
- (7) Review MEDEVAC actions or problems.
- (8) Complete DA Forms 2397-9-R and 2397-10-R.

#### D. Instructor Pilot

Conduct the investigation and data collection in terms of operations and training pertinent to the accident personnel. Normally performs the following actions:

- (1) Review individual flight records.
- (2) Review crew training records.
- (3) Complete the crew information sheet.
- (4) Review unit and higher SOPs as they apply to this accident.
- (5) Review the following for possible accident involvement:
  - Crew rest policy
  - Crew selection
  - Crew coordination
  - Briefing/back-briefing

Weather and weather briefing

Flight plan

Preflight planning

Urgency of mission

Preaccident plan

(6) Complete DA Form 2397-8-R on all crewmembers plus all others definitely contributing or suspected of contributing.

(7) Conduct postaccident evaluation checkride.

(8) Compute an aircraft weight and balance form (DD Form 365-4) and the performance planning card (PPC) data for the mission aircraft.

Crew Information Sheet:

NAME \_\_\_\_\_ GRADE \_\_\_\_\_ SSN \_\_\_\_\_  
Last First MI

HEIGHT \_\_\_\_\_ (in) WEIGHT \_\_\_\_\_ BIRTHDAY \_\_\_\_\_ SEX \_\_\_\_\_  
SEC CLEARANCE \_\_\_\_\_

DUTY DURING ACCIDENT \_\_\_\_\_ ORG/UNIT \_\_\_\_\_  
CLASS # \_\_\_\_\_

SERVICE (USA, USN, NG, Res, etc.) \_\_\_\_\_,  
RW/FW GRAD DATE \_\_\_\_\_

DATE OF MOST RECENT FLIGHT THIS SERIES (Prior to accident date)  
\_\_\_\_\_

DURATION OF THIS FLIGHT THIS SERIES (Prior to accident date)  
HRS \_\_\_\_\_ MIN \_\_\_\_\_

DATE OF LAST STANDARDIZATION FLIGHT THIS AIRCRAFT SERIES  
YR \_\_\_\_\_ MONTH \_\_\_\_\_ DAY \_\_\_\_\_

DATE LAST LEAVE ENDED: YR \_\_\_\_\_ MON \_\_\_\_\_ DAY \_\_\_\_\_ TYPE \_\_\_\_\_,  
# DAYS \_\_\_\_\_

DATE OF LAST CREWMEMBER DUTY PRIOR TO ACCIDENT  
YR \_\_\_\_\_ MONTH \_\_\_\_\_ DAY \_\_\_\_\_

HOURS FLOWN PAST 24 HOURS (include this accident) \_\_\_\_\_

HOURS FLOWN PAST 48 HRS \_\_\_\_\_ HOURS FLOWN PAST 72 HRS \_\_\_\_\_

HOURS WORKED (from arrival at duty station until departure)  
PAST 24 HRS \_\_\_\_\_ PAST 48 HRS \_\_\_\_\_

HOURS SLEPT PAST 24 HRS \_\_\_\_\_ PAST 48 HRS \_\_\_\_\_ PAST 72 HRS \_\_\_\_\_

HOURS CONTINUOUSLY AWAKE PRIOR TO ACCIDENT \_\_\_\_\_

HOURS OF LAST SLEEP PERIOD \_\_\_\_\_  
TOTAL TIME IN COCKPIT PRIOR TO FLIGHT \_\_\_\_\_

DUTY HOURS REMAINING THIS DAY HAD ACCIDENT NOT OCCURRED (based on  
12-hr duty day) \_\_\_\_\_

DATE OF LAST PHYSICAL YR \_\_\_\_\_ MO \_\_\_\_\_ DAY \_\_\_\_\_ SMOKE TOBACCO YES \_\_\_\_\_ NO \_\_\_\_\_  
IF YES, # CIGARETTES/DAY \_\_\_\_\_: CIGARS/DAY \_\_\_\_\_

TOTAL FLYING HOURS \_\_\_\_\_ COMBAT FLYING HOURS \_\_\_\_\_

INSTRUMENT QUALIFICATION/DATE R/W \_\_\_\_\_ F/W \_\_\_\_\_

EDUCATION \_\_\_\_\_ YEARS; PHYSIOLOGICAL/ALT/SURV TRAINING? \_\_\_\_\_  
TYPE \_\_\_\_\_ DATE \_\_\_\_\_

NUMBER & DATE OF PREVIOUS ACCIDENTS \_\_\_\_\_

LOCAL ADDRESS \_\_\_\_\_ HOME PHONE \_\_\_\_\_  
DUTY PHONE \_\_\_\_\_

TYPE HELMET \_\_\_\_\_: \_\_\_\_\_ VISOR \_\_\_\_\_: CLEAR/TINTED  
UP/DOWN

GLASSES: REGULAR/CLEAR/TINTED REQUIRED \_\_\_\_\_ WORN \_\_\_\_\_  
PRESCRIPTION/CLEAR/TINTED REQUIRED \_\_\_\_\_ WORN \_\_\_\_\_

UNDERWEAR: COT/WOOL SOCKS: COT/WOOL JACKET: NYLON/NOMEX  
LT/MED/HEAVY

DID SHOULDER HARNESS INERTIA REEL LOCK? YES/NO  
AUTOMATICALLY/MANUALLY

AT TIME OF THE ACCIDENT, WHERE WERE YOU LOCATED IN  
AIRCRAFT? \_\_\_\_\_

YOUR ORDER OF EXIT: FIRST, SECOND, THIRD TO GET OUT OF  
AIRCRAFT? \_\_\_\_\_

DATE GRAD. IERW \_\_\_\_\_  
IERW QUAL. AIRCRAFT \_\_\_\_\_

MTDS CURRENT/QUALIFIED \_\_\_\_\_ DATE COMP APART \_\_\_\_\_

DATE COMP ANNUAL WRIT \_\_\_\_\_ DATE COMP FAC ( ) RL ( )  
\_\_\_\_\_

DATE COMP -10 EXAM \_\_\_\_\_ QUAL IP, SIP, UT \_\_\_\_\_

DATE NVG QUAL \_\_\_\_\_ DATE LAST NVG FLIGHT \_\_\_\_\_ WAIVERS \_\_\_\_\_

DATE ASGN UNIT \_\_\_\_\_  
EXPERIENCE WHEN ASGN UNIT \_\_\_\_\_

A/C QUAL WHEN ASGN UNIT \_\_\_\_\_ A/C QUAL SINCE ASGN UNIT \_\_\_\_\_

MAJOR DUTIES WHEN ASGN UNIT \_\_\_\_\_

MAJOR DUTIES AT TIME OF ACCIDENT AND PERCENT OF TIME REQUIRED  
\_\_\_\_\_

DATE ENTERED SERVICE \_\_\_\_\_

CHRONOLOGICAL ACCOUNT OF ACTIVITIES

CHRONOLOGICAL ACCOUNT OF ACTIVITIES OF PREVIOUS 72 HOURS (For example, include duties, diet, recreational activities, parties, sleep, family illness, etc.).

## HUMAN FACTORS WORK GROUP LEADER CHECKLIST

(DA Pam 385-95)

### 2. Human Factors Investigation:

- a. Personnel background information.
- b. Personnel management.
- c. Command.
- d. Aircraft suitability.
- e. Communications/air traffic services.
- f. Navigational aids.
- g. Meteorological information.
- h. Ground support services.
- i. Crashworthiness.
- j. Personnel egress.
- k. Special investigation.
- l. Witness investigation.

This checklist is intended to ensure that minimal information is obtained to complete DA Form 2397-3-R, Human Factors Narrative, in accordance with DA Pam 385-95, para 8-7.

The human factors work group leader will ensure that the following checks are completed and appropriate comments are turned into the board president prior to deliberations. It is suggested that these various subjects be cut up and attached to comments.

### PREFLIGHT PHASE

CREW REST DEFICIENCIES	NO _____	YES _____	SEE COMMENTS
CREW SELECTION ADEQUATE	YES _____	NO _____	SEE COMMENTS
ADEQUATE WEATHER BRIEF	YES _____	NO _____	SEE COMMENTS
ADEQUATE MISSION BRIEF	YES _____	NO _____	SEE COMMENTS
ADEQUATE FLIGHT PLAN	YES _____	NO _____	SEE COMMENTS
ADEQUATE PPC	YES _____	NO _____	SEE COMMENTS
URGENCY OF MISSION	NORMAL _____	ABNORMAL _____	SEE COMMENTS
ADEQUATE ACFT PREFLIGHT	YES _____	NO _____	SEE COMMENTS

FLIGHT PHASE

ADEQUATE PERFORMANCE CHECK    YES \_\_\_\_\_ NO \_\_\_\_\_ SEE COMMENTS

ERRORS COMMITTED BY:

a. Pilot	NO _____	YES _____	SEE COMMENTS
b. Copilot	NO _____	YES _____	SEE COMMENTS
c. ATC	NO _____	YES _____	SEE COMMENTS
d. Tower	NO _____	YES _____	SEE COMMENTS
e. Support	NO _____	YES _____	SEE COMMENTS
f. Others	NO _____	YES _____	SEE COMMENTS

POSTACCIDENT

EGRESS PROBLEMS                    NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

SURVIVAL EQUIP. PROBLEM           NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

MEDEVAC PROBLEMS                   NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

ADEQUATE CRASH PLAN               NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

POSTACCIDENT EVALUATION           SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ SEE COMMENTS

CRASHWORTHINESS AS DESIGN       NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

DESIGN ERRORS                       NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

SOP REVIEW

DISCREPANCIES                       NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

Comments



FLIGHT RECORDS REVIEW

NOTE: Fill out applicable 2397-8 items while reviewing these records.

DISCREPANCIES NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

Comments

ATM REVIEW

NOTE: Fill out applicable 2397-8 items while reviewing these records.

DISCREPANCIES NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

Comments

MEDICAL RECORD REVIEW

WAIVERS NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

ABNORMALITIES NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

Comments

## MATERIEL CHECKLISTS

### A. Aircraft airworthiness.

- \_\_\_\_\_ 1. Inventory all major systems/components assigned to aircraft.
- \_\_\_\_\_ 2. Inventory material issued to crewmember for mission.
- \_\_\_\_\_ 3. Were all material systems in operating condition as indicated by records checks?
- \_\_\_\_\_ 4. Dates of last maintenance/inspection on material systems specific to aircraft and crewmembers.
- \_\_\_\_\_ 5. Any indication of chronic malfunctions of systems as evidenced by maintenance records.
- \_\_\_\_\_ 6. Types and reasons for last maintenance actions.

### B. Materiel systems normal flight operations.

- \_\_\_\_\_ 1. Material discrepancies noted during preflight. Returned to operating control? If not, other systems affected or limitations on mission by this discrepancy.
- \_\_\_\_\_ 2. Any caution of advisory indications noted during flight operations. Action taken to correct or disable.

Para 8-7, b, (1), (c).

### C. Airframe (Includes landing gear, flight controls).

- \_\_\_\_\_ 1. Is airframe intact?
- \_\_\_\_\_ 2. If not intact, where is the failure?
- \_\_\_\_\_ 3. Did failure occur in the air?
- \_\_\_\_\_ 4. Did failure occur at impact?
- \_\_\_\_\_ 5. Was the failure a contributing factor in the accident (initial)?
- \_\_\_\_\_ 6. Was the failure a result of another failure (secondary)?
- \_\_\_\_\_ 7. Was the aircraft carrying an internal load?
- \_\_\_\_\_ 8. If load, what type?
- \_\_\_\_\_ 9. Was load properly placed and secured? Was aircraft within CG and gross weight limits?
- \_\_\_\_\_ 10. Is there evidence of other than ground impact?
- \_\_\_\_\_ 11. Have measures been taken to ensure that both sides of a fracture have been completely examined?
- \_\_\_\_\_ 12. Are all parts present? If not, has a search been initiated to find them?
- \_\_\_\_\_ 13. Is a metallurgical analysis necessary?
- \_\_\_\_\_ 14. What was position of following (as applicable) at time of accident?  
Gear \_\_\_\_\_ gear indicator \_\_\_\_\_  
Flaps \_\_\_\_\_ flap indicator \_\_\_\_\_
- \_\_\_\_\_ 15. The following items should be checked for breakage, misalignment, and/or jammed parts of control linkages?
  - a. All control surfaces.
  - b. Hinges, bell cranks, "push-pull" tubes, cables, pulleys, balances, and tab mechanisms.
  - c. Rotor head and quadrant assemblies.
  - d. Linear actuators and bungle assemblies.

- e. Hydraulic servos/actuators.
- f. Magnetic stop units and hydraulic accumulators.
- g. Transmission and drive shafts.
- h. Rotor blade pitch change links.

- \_\_\_ 16. Is it probable that failure of any parts resulted from:  
improper design \_\_\_\_\_ wear \_\_\_\_\_  
neglect \_\_\_\_\_ impact \_\_\_\_\_
- \_\_\_ 17. Were there external appendages? If so, could they have  
possibly adversely affected flight characteristics?
- \_\_\_ 18. Has complete control system been traced and carefully  
inspected for evidence of separation and/or bending? If evidence  
exists, determine if it was caused prior to or because of impact  
forces.
- \_\_\_ 19. Check all control surfaces for proper installation and  
attachment.
- \_\_\_ 20. Check and record surface travel for the following  
components:  
rudder \_\_\_\_\_ cyclic control \_\_\_\_\_  
elevator \_\_\_\_\_ collective pitch control \_\_\_\_\_  
aileron \_\_\_\_\_ antitorque rotor \_\_\_\_\_  
antitorque rotor pedals \_\_\_\_\_
- \_\_\_ 21. Determine if aircraft was subjected to extreme gusts while  
moored without proper control locks installed.
- \_\_\_ 22. Determine, if possible, whether aircraft was subjected to  
high aero-dynamic forces caused by violent flight maneuvers or  
in-flight turbulence.
- \_\_\_ 23. Has aircraft recently been operated from rough unimproved  
fields?
- \_\_\_ 24. Have other abnormal forces been applied to the landing gear  
or skids?
- \_\_\_ 25. Is there evidence of repeated abnormal contact of control  
surfaces against their stops and/or evidence of hard  
landing?
- \_\_\_ 26. Has aircraft been operated extensively in tropics or near  
salt water?

Para 8-7, b, (1), (c)

#### D. Ejection seats.

- \_\_\_ 1. If occupant did not eject, determine, if possible, if  
ejection was attempted.
- \_\_\_ 2. Is ejection seat in safe condition? If it has not been  
fired, have it disarmed by qualified personnel prior to moving.
- \_\_\_ 3. Is seat to primary charge in normal position?
- \_\_\_ 4. What is position of upper and lower firing handles?
- \_\_\_ 5. Check for position of the trip rods.
- \_\_\_ 6. Determine, when possible, if the seat fired from impact  
forces or from being activated by the occupant.
- \_\_\_ 7. If ejection accomplished successfully, determine the  
following: means of escape, upper, or lower handle.

Was canopy released prior to ejection? \_\_\_\_\_

Aircraft speed at ejection. \_\_\_\_\_

- \_\_\_\_\_ 8. If fire consumed an electrical component, obtain a complete story of the condition existing before and at time of failure.
- \_\_\_\_\_ 9. If faulty wiring is a factor, check terminal connectors, routing, clamping, chafing, deterioration, etc.
- \_\_\_\_\_ 10. Was suspected system protected by a circuit breaker or fuse.
- \_\_\_\_\_ 11. Check rotating electrically operated equipment to determine if \_\_\_\_\_ operating at impact.

E. Communication, instrument, and electrical systems.

- \_\_\_\_\_ 1. Determine and record the settings of pertinent switches, dials, \_\_\_\_\_ and controls and note installation and location of antennas.
- \_\_\_\_\_ 2. Determine if crewmembers, crash rescue personnel, or early arrivals at the scene moved any of the controls, \_\_\_\_\_ installation, \_\_\_\_\_ or switches.
- \_\_\_\_\_ 3. Check maintenance forms and obtain assistance of \_\_\_\_\_ communications \_\_\_\_\_ or electronics experts as necessary.
- \_\_\_\_\_ 4. Check reliability of radios, electronic equipment, and use of \_\_\_\_\_ other navigational aids.
- \_\_\_\_\_ 5. Determine, if possible, navigational aids used.
- \_\_\_\_\_ 6. If necessary, carefully inspect both engine and navigational \_\_\_\_\_ instruments and record the readings.
- \_\_\_\_\_ 7. Check maintenance history, accuracy, and possible inadvertent \_\_\_\_\_ misuse of suspected engine and navigational instruments.
- \_\_\_\_\_ 8. Photograph instrument panel for later use.
- \_\_\_\_\_ 9. If necessary, utilize ultraviolet light on instrument face to \_\_\_\_\_ establish needle position at impact. (Ultraviolet light may also be used to read burned aircraft records.)

F. Engine/power plant.

- \_\_\_\_\_ 1. Were propellers bent upon impact? Forward or backwards?
- \_\_\_\_\_ 2. Check and record propeller blade angle settings.
- \_\_\_\_\_ 3. Check propeller hub and teeth of blade segment gears and master \_\_\_\_\_ drive gear for indentations. Compare worked teeth with an undamaged gear to identify blade angles at impact.
- \_\_\_\_\_ 4. Check propeller marks on ground or other objects.
- \_\_\_\_\_ 5. Check any objects for possible rotor blade contact prior to impact.
- \_\_\_\_\_ 6. Preserve and pay particular attention to ground scars made by \_\_\_\_\_ main rotor or tail rotor.
- \_\_\_\_\_ 7. Compare blade strikes on fuselage with section of main rotor or tail rotor that made contact.
- \_\_\_\_\_ 8. Check attaching areas of main rotor blade for:  
continuity \_\_\_\_\_  
fatigue failure \_\_\_\_\_  
proper security of all fittings \_\_\_\_\_
- \_\_\_\_\_ 9. Check power train for torsional twisting.

- \_\_\_ 10. Are all major pieces of main and tail rotor blades accounted for?
- \_\_\_ 11. Has every effort been made to determine the cause of engine failure while at the accident scene?
- \_\_\_ 12. Determine engine components, if any, to be sent to CCAD for analysis. Monitor closely.
- \_\_\_ 13. Engine examined in the field, obtain the following:
- a. Serial number
  - b. Manufacturer, type, and model
  - c. Pertinent information from flight, maintenance, inspection records
- \_\_\_ 14. When engine examined in the field, accomplish the following:
- a. Locate all accessories and components pertinent to engine operations.
  - b. Check position of primary and secondary controls to determine the position of the various valves controlling the flow of fuel to the engine, including the primer.
  - c. Obtain pertinent engine operation data prior to the accident.
  - d. Determine duration of flight before accident to determine if fuel exhaustion may be involved.
  - e. Obtain information from witnesses about engine operations such as smoke, fire explosion, or unusual noise.
  - f. If fire was a factor, was it located in the fuselage or nacelle position of the aircraft?
  - g. Check the system for leaks or obstructions from fuel tanks to combustion chamber.
  - h. Check fluid carrying lines for improper installation or signs of malfunction.
  - i. Check oil strainer and sump for foreign particles.
  - j. Check the ignition system to include magnetos, switches, spark plugs, and leads.

G. Materiel/systems (rotors or propellers).

- \_\_\_ 1. Collect and inventory; reconstruct the whole assembly if possible.
- \_\_\_ 2. Examine damage/scarring to determine if systems were turning at impact and if power was applied at impact.
- \_\_\_ 3. Examine all linkage from cockpit controls to systems for continuity/disconnect, all bearing assemblies and/or blade grips for failure prior to impact.
- \_\_\_ 4. Check for serial numbers of blades/propellers against historical records.

H. Transmission/gearboxes.

- \_\_\_ 1. Determine if CCAD teardown is necessary.
- \_\_\_ 2. Determine if any damage was the result of or was a cause factor in the accident.
- \_\_\_ 3. Check witnesses to determine if operating properly; i.e., grinding noises, smoking, etc.

- \_\_\_\_\_ 4. If a factor, check all linkages and connectors for breakage, etc.
- \_\_\_\_\_ 5. Check for oil. Take sample.
- \_\_\_\_\_ 6. Check sumps, extensions, mounting, gears, vents, etc.
- \_\_\_\_\_ 7. Check chip detectors for chips.
- \_\_\_\_\_ 8. Check for heat discoloration.
- \_\_\_\_\_ 9. Check cases for cracks or distortion.
- \_\_\_\_\_ 10. Check control linkage or cables for continuity.

## MATERIEL FACTORS WORK GROUP LEADER CHECKLIST

The material factors work group leader will ensure that the following checks are completed and appropriate comments turned into the board president prior to deliberations.

### MATERIEL INSPECTION

FAILURE/MALFUNCTION NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

DESIGN ERRORS NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

Comments

### MAINTENANCE SOP REVIEW

ADEQUATE YES \_\_\_\_\_ NO \_\_\_\_\_ SEE COMMENTS

FOLLOWED YES \_\_\_\_\_ NO \_\_\_\_\_ SEE COMMENTS

Comments

### WEIGHT AND BALANCE RECORDS REVIEW

NOTE: Fill out an accurate 365-4/365F for report purposes.

ERRORS NO \_\_\_\_\_ YES \_\_\_\_\_ SEE COMMENTS

Comments

MAINTENANCE RECORDS REVIEW

(Current & Six Months)

DISCREPANCIES

NO \_\_\_\_\_

YES \_\_\_\_\_

SEE COMMENTS

Comments

HISTORICAL RECORDS REVIEW

DISCREPANCIES

NO \_\_\_\_\_

YES \_\_\_\_\_

SEE COMMENTS

SERIAL NUMBER CHECK

NO ERRORS \_\_\_\_\_

ERRORS \_\_\_\_\_

SEE COMMENTS

Comments

POL ANALYSIS

DISCREPANCIES

NO \_\_\_\_\_

YES \_\_\_\_\_

SEE COMMENTS

Comments



## APPENDIX L

### INSTRUCTIONS FOR ANALYZING HUMAN ERROR

1. The 3W approach for determining causes of accidents as it relates to our reports is shown below:

WHAT HAPPENED - Task Error  
WHY DID IT HAPPEN - System Inadequacy  
WHAT TO DO ABOUT IT - Recommendations

2. The why or system inadequacy in most accidents can be attributed to a failure to train to standards or to a failure of enforcing these standards. (See page L-3 at this appendix for examples of failures.)

3. In human error accidents, it is relatively easy to identify errors, but the system inadequacy(ies) is the real issue and often the most difficult to determine. Accident investigators will define system inadequacy(ies) in terms of the following:

a. Standards Failure

- Standards do not exist.
- Standards exist but are not clear or practical.

b. Training Failure

- Standards exist but are not known.
- Ways to achieve standards are not known.

c. Leader Failure

- Standards are known but not enforced.

d. Individual Failure

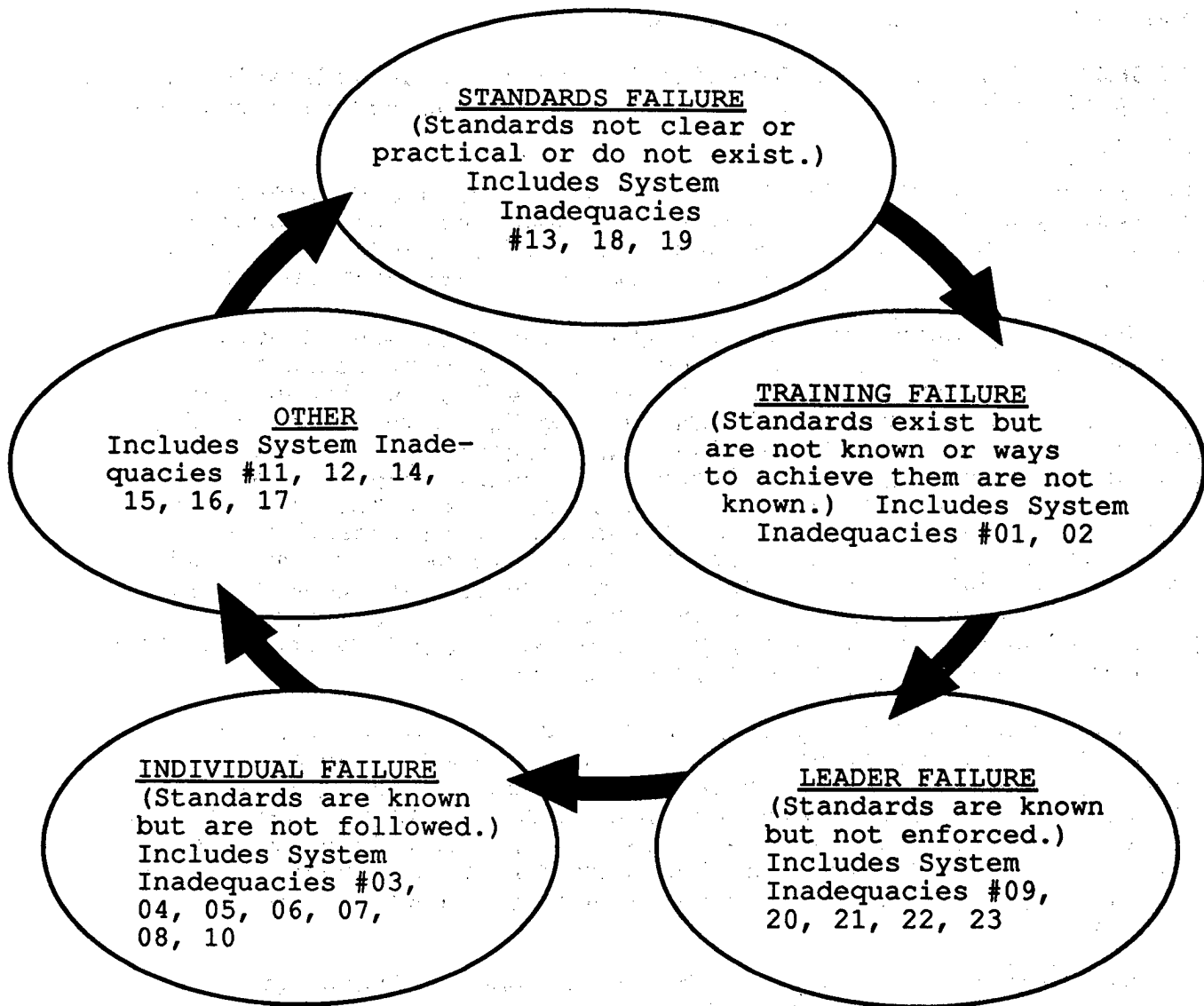
- Standards are known but not followed.

4. When conducting the commander's outbrief (see format at Appendix O), the analysis of human error should be explained in the terms above, since most human error accidents are the results of failing to train to or following standards. Do this through the methodology below:

a. Explain how/why standards, leader, training, or individual failure was eliminated.

b. Explain how your conclusion that standards, leader, training, or individual failure, or a combination of these caused the accident.

## TRAINING TO STANDARDS



NOTES: In some cases, certain system inadequacies might be more appropriate in another category based on the situation (i.e., If SI 08 is used to indicate command pressure, it would be more appropriate under leader failure. In the same fashion, SI 09 might fall under individual failure under certain circumstances). Most of the system inadequacies that fall under the other category are usually not associated with human error.

APPENDIX M

GUIDANCE FOR COMPLETION OF THE ANALYSIS

CSSC-I

MEMORANDUM FOR: All Investigators

SUBJECT: Investigation Division Policy #1, Standardization of the Analysis Paragraph in Both Aviation and Ground Accident Reports

1. In the interest of clarity, consistency, and completeness, the analysis paragraph of all accident reports will be standardized in terms of subjects addressed and manner of presentation. This policy applies both to aviation and ground accident reports.
2. Begin the paragraph by specifying the scope and general conclusions of the investigation. In all cases, begin the paragraph with these words: "After analyzing the human, materiel, and environmental data collected during the investigation, the board concluded that the accident was caused by...." Complete the sentence by specifying the factor(s) (human, materiel, or environmental) which caused the accident, e.g., "....human error on the part of both crewmembers. The board further concluded that materiel failure after the onset of the emergency contributed to the severity of the accident. The rationale for these conclusions is as follows:" Please note that all three major factors (human, materiel, and environmental) have been addressed up front in terms of whether they contributed to the accident.
3. Use subparagraphs to support your conclusions. Your board deliberation/conclusions (task errors, system inadequacies, etc.) should be in hand as you write the analysis and your analysis should track with your eventual findings. It is neither necessary nor desirable to restate the history of flight. The description of events should be limited to that necessary to thoroughly address and evaluate unsafe acts and conditions in terms of who, what, when, and why.
4. The next major paragraph should include a discussion of the injury data, if applicable. An excellent example can be found on page 8-21, DA Pam 385-95.
5. The next major paragraph should include a discussion of the witness interviews, if desired. Note the number of witnesses interviewed and briefly what they said. The witness summary is in the analysis paragraph to preclude FOIA release with the narrative. Witness comments which support your conclusions should be discussed as necessary in other portions of the analysis.

CSSC-I

SUBJECT: Investigation Division Policy Letter #1, Standardization of the Analysis Paragraph in Both Aviation and Ground Accident Reports

6. The last major paragraph should include a discussion of those issues which were not accident or injury cause related, but which may cause or contribute to an accident if left uncorrected. Again, an excellent example for this paragraph can be found on page 8-22, DA Pam 385-95.

7. I am confident that standardization of the analysis paragraph will not only make reports easier to read, but also easier to write. I invite all investigators to share with me and other investigators your ideas for improving our reports.

Chief, Investigation Division

APPENDIX N

FORMAT OF ACCIDENT OUTBRIEF

INTRODUCTION:

PURPOSE  
REPORT CLASSIFICATION  
EXCUSE COLLATERAL BOARD MEMBERS  
INTRODUCE BOARD MEMBERS

HISTORY OF THE FLIGHT/SEQUENCE OF EVENTS

OPERATIONAL FORCES INVOLVED  
MISSION  
PLANNING PHASE  
EXECUTION PHASE  
ACCIDENT PHASE  
POST-ACCIDENT PHASE  
ESTIMATED COST OF DAMAGE

PHOTOS/SLIDES

ANALYSIS:

HUMAN - SEE APPENDIXES M & N  
MATERIEL  
ENVIRONMENTAL

PRESENT AND CONTRIBUTING FINDINGS AND RECOMMANDATONS

WHAT CAUSED THE ACCIDENT AND WHY IT HAPPENED

PRESENT BUT NOT CONTRIBUTING INTRODUCTION

PRESENT BUT NOT CONTRIBUTING FINDINGS AND RECOMMENDATIONS

WHAT WAS FOUND AND WHY IT SHOULD BE CORRECTED

LAUDATORY COMMENTS

QUESTIONS

APPENDIX O

SAMPLE FORMAT OF A COMPLETED OUTBRIEF

1. INTRODUCTION:

A. GENERAL \_\_\_\_\_, \_\_\_\_\_, GENTLEMEN,  
GOOD MORNING/AFTERNOON. I AM \_\_\_\_\_, PRESIDENT OF THE  
U.S. ARMY SAFETY CENTER CENTRALIZED ACCIDENT INVESTIGATION BOARD,  
APPOINTED TO INVESTIGATE THE ACCIDENT WHICH OCCURRED ON  
\_\_\_\_\_, AT \_\_\_\_\_.

B. THIS WILL BE A FIELD BRIEFING ON OUR FINDINGS AND  
RECOMMENDATIONS. BASED UPON INFORMATION CURRENTLY AVAILABLE TO THE  
INVESTIGATION BOARD.

C. THIS INFORMATION HAS BEEN STAFFED WITH THE U.S. ARMY SAFETY  
CENTER.

D. THIS BRIEFING IS RESTRICTED TO "LIMITED  
USE FOR ACCIDENT PREVENTION PURPOSES ONLY," AND IS NOT TO BE USED  
FOR ANY OTHER PURPOSE, TO INCLUDE DISCIPLINARY OR ADVERSE PERSONNEL  
ACTIONS.

E. COLLATERAL BOARD MEMBERS, IF PRESENT, ARE REQUESTED TO BE  
EXCUSED AT THIS TIME.

F. SIR, AT THIS TIME I WOULD LIKE TO INTRODUCE THE OTHER  
MEMBERS OF THE BOARD.

(1) ALSO FROM THE U.S. ARMY SAFETY CENTER ARE  
\_\_\_\_\_ FOR THIS INVESTIGATION.

(2) LOCAL MEMBERS ARE:

(a) CPT \_\_\_\_\_, COMMANDING OFFICER, \_\_\_\_\_.

(b) CW3 \_\_\_\_\_, QUALITY CONTROL OFFICER, \_\_\_\_\_.

(c) CW2 \_\_\_\_\_, INSTRUCTOR PILOT, \_\_\_\_\_.

(d) SSG \_\_\_\_\_, TECHNICAL INSPECTOR, \_\_\_\_\_.

(e) CW3 \_\_\_\_\_, SAFETY OFFICER, \_\_\_\_\_.

MR. \_\_\_\_\_ WAS OUR POINT OF CONTACT FOR THIS INVESTIGATION.

2. SEQUENCE OF EVENTS. THE SEQUENCE OF EVENTS RELATING TO THIS ACCIDENT IS AS FOLLOWS:

A. OPERATIONAL FORCES INVOLVED

B. MISSION

1. THE VISUAL FLIGHT RULES (VFR) MISSION WAS A SCHEDULED SERVICE MISSION, IN CONJUNCTION WITH ATM REQUIREMENTS, TO \_\_\_\_\_

2. S-3 OPERATIONS, \_\_\_\_\_, RECEIVED THE MISSION ON \_\_\_\_\_, AND ASSIGNED THE ACCIDENT VICTIM, \_\_\_\_\_, AS MISSION PILOT-IN-COMMAND AND TASKED THE FLIGHT DETACHMENT, \_\_\_\_\_, FOR THE MISSION.

C. PLANNING PHASE

1. \_\_\_\_\_ PERFORMED A PREFLIGHT INSPECTION OF THE AIRCRAFT AND COMPLETED HIS PREMISSION PLANNING ON THE AFTER-NOON OF \_\_\_\_\_.

2. AT \_\_\_\_\_ LOCAL ON \_\_\_\_\_, HE RECEIVED A WEATHER BRIEFING AT \_\_\_\_\_ WEATHER DETACHMENT. HE WAS TOLD THAT EN ROUTE CONDITIONS WERE VFR WITH A MINIMUM CEILING OF 1,000 FEET LOCATED BETWEEN \_\_\_\_\_, AND A MINIMUM VISIBILITY OF 1,000 METERS ALONG THE ROUTE DUE TO \_\_\_\_\_. HE WAS TOLD THAT VERY FEW STATIONS WERE REPORTING AT THAT TIME OF THE MORNING AND THAT FOG WOULD BE HIS BIGGEST PROBLEM IN \_\_\_\_\_.

3. SOMETIME BEFORE \_\_\_\_\_ LOCAL, \_\_\_\_\_ TELEPHONICALLY UPDATED HIS WEATHER AND STATED TO HIS CREW CHIEF THAT WEATHER HAD DETERIORATED AND HE HAD "BARE MINIMUMS."

D. EXECUTION PHASE

1. \_\_\_\_\_ DEPARTED \_\_\_\_\_ UNDER SPECIAL VFR AT \_\_\_\_\_ LOCAL AND ARRIVED AT \_\_\_\_\_ ARMY AIRFIELD UNDER A SPECIAL VFR CLEARANCE AT \_\_\_\_\_ LOCAL. THE FIRST LEG OF HIS FLIGHT WAS UNEVENTFUL, AND THE AIRCRAFT WAS SHUT DOWN AND REFUELED. DOWNTIME AT \_\_\_\_\_ ARMY AIRFIELD WAS APPROXIMATELY \_\_\_\_\_ MINUTES, AND AT NO TIME DID \_\_\_\_\_ RECHECK WEATHER.

2. HE DEPARTED WITH HIS PASSENGER FROM \_\_\_\_\_ AT \_\_\_\_\_ LOCAL UNDER SPECIAL VFR CONDITIONS. SHORTLY THEREAFTER, HE REQUESTED A FREQUENCY CHANGE FROM \_\_\_\_\_ TOWER FREQUENCY TO AN INFORMATION FREQUENCY OF 125.40.

3. AT 0820 LOCAL, HE CALLED CHECKPOINT \_\_\_\_\_, AND AT \_\_\_\_\_ LOCAL, HE CALLED APPROACHING CHECKPOINT \_\_\_\_\_.

4. AT 0831:13, HE CALLED \_\_\_\_\_ INFORMATION AND STATED HE WAS INADVERTENT IMC WITH NO REPLY FROM \_\_\_\_\_.

5. AT 0831:33, HE AGAIN CALLED \_\_\_\_\_ INFORMATION WITH AGAIN NO REPLY.

#### E. ACCIDENT PHASE

1. AT 0831:44, THE AIRCRAFT CRASHED ON A WOODEN MOUNTAINSIDE 2 KILOMETERS SOUTH OF \_\_\_\_\_.

#### F. POST-ACCIDENT PHASE

1. AT APPROXIMATELY \_\_\_\_\_ LOCAL, THE WRECKAGE WAS LOCATED BY THE LOCAL POLICE.

2. SOMETIME BETWEEN \_\_\_\_\_ AND \_\_\_\_\_, BOTH VICTIMS WERE PRO-NOUNCED DEAD AT THE CRASH SITE BY A \_\_\_\_\_ DOCTOR.

3. AT APPROXIMATELY \_\_\_\_\_, BOTH BODIES ARRIVED BY MEDEVAC AT THE \_\_\_\_\_ HOSPITAL.

#### G. ESTIMATED COST OF DAMAGE

ESTIMATED DAMAGE TO THE AIRCRAFT AND MILITARY EQUIPMENT IS \$ \_\_\_\_\_. IN ADDITION, THERE WERE TWO FATALITIES (ONE ARMY AVIATOR AND ONE \_\_\_\_\_).

3. SLIDES. SIR, AT THIS TIME I WOULD LIKE TO SHOW YOU SOME SLIDES OF THE ACCIDENT SITE.

4. ANALYSIS. IN DETERMINING THE CAUSE OF THIS ACCIDENT, WE EVALUATED THE HUMAN, MATERIEL, AND ENVIRONMENTAL FACTORS THAT MAY HAVE CONTRIBUTED TO THIS ACCIDENT.

A. ENVIRONMENTAL FACTORS WERE ELIMINATED BECAUSE.....

B. HUMAN FACTORS WERE ELIMINATEE BECAUSE.....

C. MATERIEL FACTORS WERE ELIMINATED BECAUSE.....

NOTE: USE APPLICABLE FACTORS.

5. OUR FINDINGS ARE AS FOLLOWS: THE BOARD CONCLUDES THAT THE CAUSE OF THIS ACCIDENT WAS DUE TO HUMAN ERROR.

FINDING 1 (PRESENT AND CONTRIBUTING: HUMAN ERROR - INDIVIDUAL FAILURE):

THE PILOT OF THE OH-58 HELICOPTER FAILED TO FOLLOW ESTABLISHED PROCEDURES AFTER HE ENTERED INADVERTENT IMC. HE FAILED TO COMPLY WITH STEPS 3 AND 4 OF THE \_\_\_\_\_ SUPPLEMENT 1 TO AR 95-1



WHICH REQUIRES AN ADJUSTMENT IN POWER, AN ESTABLISHMENT OF A CLIMB TO THE APPROPRIATE SECTOR ALTITUDE OF 4,500 FEET AND AN ADJUSTMENT OF AIRSPEED. AS A RESULT, THE AIRCRAFT CRASHED INTO A WOODED MOUNTAIN SIDE, FATALLY INJURING THE PILOT AND PASSENGER.

THERE WERE NO SURVIVORS AND NO WITNESS TO THE ACTUAL CRASH. THEREFORE, WE CAN ONLY SUSPECT WHY THE PILOT DID NOT COMPLY WITH THE ESTABLISHED INADVERTENT IMC PROCEDURES. THOSE SUSPECT REASONS ARE:

A. EXCITEMENT, APPREHENSION, AND CONCERN UPON ENTERING IMC MAY HAVE AFFECTED HIS NORMAL THOUGHT PROCESS, CAUSING HIM TO IMPROPERLY REACT TO THE SITUATION. VOICE EXCERPTS FROM THE INFORMATION TAPES REVEALED THAT \_\_\_\_\_ WAS VERY CONCERNED.

B. \_\_\_\_\_ WAS A SOLO PILOT IN AN AIRCRAFT THAT WAS NOT INSTRUMENT CERTIFIED. HE WAS KNOWLEDGEABLE OF IMC LIMITATIONS OF HIS AIRCRAFT AS EVIDENCED BY PREVIOUS DUAL FLIGHTS IN WHICH HE DECIDED TO AVOID IMC CONDITIONS BY EITHER LANDING OR RETURNING TO HOME BASE. IT IS SUSPECTED THAT HE WAS ATTEMPTING TO AVOID CLIMBING IN HOPES OF REESTABLISHING VFR CONDITIONS.

C. ALTHOUGH HE MADE THE RADIO CALL DECLARING INADVERTENT IMC, HE MAY NOT HAVE TOTALLY ACCEPTED THE FACT THAT HE WAS IN AN ACTUAL IMC SITUATION.

IN MOST HUMAN ERROR-RELATED ACCIDENTS, THE ERROR CAUSING THE ACCIDENT CAN USUALLY BE TIED IN SOME WAY TO A FAILURE TO TRAIN TO STANDARD OR TO ENFORCE STANDARDS. WE HAVE CLASSIFIED THIS ERROR AS AN INDIVIDUAL FAILURE BECAUSE WE CAN ELIMINATE STANDARDS FAILURE, TRAINING FAILURE, AND LEADERSHIP FAILURE FOR THE FOLLOWING REASONS:

(1) STANDARDS THAT ARE CLEAR AND PRACTICAL DO EXIST FOR IMC PROCEDURES.

(2) \_\_\_\_\_ WAS TRAINED TO A CLEAR AND PRACTICAL STANDARD DURING FLIGHT SCHOOL AND UNIT-LEVEL TRAINING.

(3) \_\_\_\_\_ WAS QUALIFIED TO PERFORM THE MISSION. HIS FAILURE WAS THAT STANDARDS WERE KNOWN BUT WERE NOT FOLLOWED.

#### RECOMMENDATION 1

A. UNIT LEVEL ACTION

B. HIGHER LEVEL ACTION

C. ARMY LEVEL ACTION

FINDING 2 (PRESENT AND CONTRIBUTING: HUMAN ERROR - INDIVIDUAL

FAILURE) :

THE PILOT OF THE OH-58 HELICOPTER ENTERED INADVERTENT IMC BECAUSE HE MADE A DECISION TO DEPART \_\_\_\_\_ ARMY AIRFIELD WITHOUT UPDATING HIS EN ROUTE WEATHER. THAT IS, HIS INITIAL -1 WEATHER BRIEFING AT \_\_\_\_\_ HAD INDICATED A "WORSE CONDITION" WITH A CEILING OF 1,000 FEET AND A VISIBILITY OF 1,000 METERS TO BE EXPECTED IN THE \_\_\_\_\_ AREA. THIS FORECAST WAS GIVEN AT 0555 LOCAL AND INCLUDED MINIMUM SYNOPTIC WEATHER INFORMATION AVAILABLE AT THE TIME. SEVERAL INDICATORS EXISTED THAT SHOULD HAVE ALERTED THE PILOT TO THE FACT THAT CONDITIONS WERE WORSE THAN FORECAST (I.E., (1) WEATHER AT \_\_\_\_\_ HAD DETERIORATED TO A 900-FOOT CEILING AND 1,000 METERS VISIBILITY PRIOR TO HIS DEPARTURE, (2) HE WAS TOLD BY THE WEATHER FORECASTER AT \_\_\_\_\_ TO EXPECT WORSE CONDITIONS, PRIOR TO BETTER CONDITIONS, BECAUSE OF FOG IN \_\_\_\_\_, (3) A HOLDING AIRCRAFT ON THE TOWER FREQUENCY AT \_\_\_\_\_ ADVISED TOWER THAT WEATHER WAS DETERIORATING IN THEIR VICINITY). HAD HE RECEIVED A WEATHER UPDATE AT \_\_\_\_\_, HE WOULD HAVE LEARNED THAT VFR MINIMUMS NO LONGER EXISTED ALONG HIS ROUTE OF FLIGHT. AS A RESULT, AFTER A SPECIAL VFR DEPARTURE FROM \_\_\_\_\_ ARMY AIRFIELD AND AT A DISTANCE OF APPROXIMATELY 12 NAUTICAL MILES SOUTHEAST, HE ENTERED INADVERTENT IMC.

AGAIN, THE QUESTION IS: WHY DID \_\_\_\_\_ DECIDE TO DEPART \_\_\_\_\_ WITHOUT FIRST UPDATING HIS WEATHER? WE KNOW THAT HIS PASSENGER HAD NO SPECIFIC TIME TO BE AT \_\_\_\_\_; THEREFORE, THE POSSIBILITY THAT \_\_\_\_\_ WAS IN A HURRY OR WAS RUSHED WAS NOT CONSIDERED A FACTOR. COMMAND PRESSURE WAS NOT CONSIDERED A FACTOR SINCE THIS WAS ONLY A SERVICE MISSION. AGAIN, WE CAN ONLY SUSPECT WHY HE DID NOT UPDATE HIS WEATHER AND DECIDED TO DEPART \_\_\_\_\_. THOSE SUSPECT REASONS ARE:

A. \_\_\_\_\_ HAD FLOWN THIS ROUTE A NUMBER OF TIMES WHEN HE WAS THE DETACHMENT COMMANDER OF THE \_\_\_\_\_ AVIATION COMPANY AT \_\_\_\_\_. HE MAY HAVE BEEN OVERCONFIDENT IN HIS ABILITY TO REACH \_\_\_\_\_ BECAUSE OF PREVIOUS UNEVENTFUL TRIPS OR SOMEWHAT COMPLACENT IN THE FACT EVEN IF WEATHER WAS MINIMAL, NOTHING HAD HAPPENED TO HIM DURING THE FIRST LEG OF THE FLIGHT; THEREFORE, CONDITIONS WERE OKAY FOR THE SECOND LEG.

B. THE OPPORTUNITY OF SPENDING AN ENTIRE DAY AT \_\_\_\_\_ MAY HAVE MOTIVATED HIM TO THE POINT THAT WEATHER WAS OF ONLY MINOR CONCERN.

WE HAVE CLASSIFIED THIS ERROR ALSO AS AN INDIVIDUAL FAILURE BECAUSE WE CAN ELIMINATE A STANDARDS FAILURE, TRAINING FAILURE, AND LEADERSHIP FAILURE FOR THE FOLLOWING REASONS:

A. STANDARDS THAT ARE CLEAR AND PRACTICAL DO EXIST FOR UPDATING WEATHER. \_\_\_\_\_ SUPPLEMENT 1 TO AR 95-1 STATES

THAT WEATHER UPDATES WILL BE MADE AT EN ROUTE STOPS OR AT LEAST EVERY 2 HOURS. ALTHOUGH \_\_\_\_\_ HAD ONLY FLOWN 45 MINUTES PRIOR TO LANDING AT \_\_\_\_\_, CURRENT WEATHER CONDITIONS AT \_\_\_\_\_ SHOULD HAVE ALERTED HIM TO UPDATE HIS EN ROUTE WEATHER.

B. \_\_\_\_\_, ALONG WITH EVERY ARMY AVIATOR, HAS BEEN TRAINED IN THE IMPORTANCE OF UPDATING WEATHER. THE TRAINING STANDARDS IN FLIGHT SCHOOL AND UNIT-LEVEL TRAINING ARE CLEAR AND PRACTICAL.

C. \_\_\_\_\_ WAS QUALIFIED TO PERFORM THE MISSION. HIS FAILURE WAS THAT STANDARDS WERE KNOWN BUT WERE NOT FOLLOWED.  
RECOMMENDATION 2

A. UNIT LEVEL ACTION

B. HIGHER LEVEL ACTION

C. ARMY LEVEL ACTION

SIR, THIS CONCLUDES MY BRIEFING.

AT THIS TIME I WOULD LIKE TO EXPRESS TO YOU MY APPRECIATION FOR THE OUTSTANDING SUPPORT THAT WE HAVE RECEIVED WHILE CONDUCTING THIS INVESTIGATION. THE CALIBER OF \_\_\_\_\_ PERSONNEL WHO AUGMENTED OUR TEAM IS EXCEPTIONAL, AND THEIR PROFESSIONALISM AND DEDICATION TO THE BOARD HAVE BEEN EXEMPLARY. A SPECIAL RECOGNITION TO \_\_\_\_\_ FOR HIS SUPERB EFFORTS AS OUT POINT OF CONTACT AND TO \_\_\_\_\_ AND \_\_\_\_\_ FOR THEIR EXCELLENT SUPPORT.

6. CLOSING: QUESTIONS AND COMMENTS, THANK YOU SIR, DO YOU HAVE ANY QUESTIONS?

APPENDIX P

FORMAT FOR THE PRELIMINARY REPORT

1. Right Side - Tabs

TAB

A  
B  
C  
D  
E

DOCUMENTS

Accident Summary  
Sequence of Events  
Findings & Recommendations  
Accident Outbrief w/o Findings and  
Recommendations.  
Command Feedback/Attendees

2. Left Side

Photos with captions.

APPENDIX Q

SAMPLE FORMAT (AVIATION)\_

DEPARTMENT OF THE ARMY  
Headquarters XVIII Airborne Corps and Fort Bragg  
Fort Bragg, North Carolina 28307

SAMPLE

AFZA-AC-SASS

1 November 1987

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Aircraft Accident, UH-60A, Serial Number 79-23316

1. Under the provisions of DA Pam 385-95 and AR 385-40, the following individuals are appointed to the Aircraft Accident Investigation Board, effective 26 October 1987.

MAJ Raymond L. Beauregard, 035-26-0473, Ft. Rucker, AL  
(President)  
CW4 Jonnie J. Nading, 515-46-6192, Ft. Rucker, AL (Recorder)  
DAC John L. Garner, 430-72-1094, Ft. Rucker, AL (Human Factors)  
CPT Randall J. Bolar, 271-64-5511, HHC, 269th Avn Bn, Ft. Bragg,  
(Flight Surgeon)  
1LT Deborah M. Stewart, 466-94-3921, F Co, CAB, Ft. Bragg, NC  
(Maintenance Officer)  
CW4 Albert F. Whitlow, 559-86-9484, B Co, 82d CAB, Ft. Bragg, NC  
(Instructor Pilot)

2. The purpose of this board is to gather and evaluate evidence, both material and written, which caused or contributed to the aircraft accident on 25 October 1987; to recommend action and/or policies which will prevent future accidents and to prepare findings and recommendations in accordance with DA Pam 385-95 and AR 385-40.

3. The board will receive a briefing by the Installation Aviation Safety Officer or his representative on conduct and management of the investigation. Individuals will be released from all other duties for full-time participation in the investigation and cannot be removed from this detail except with the approval of the Chief of Staff, XVIII Airborne Corps and Fort Bragg.

FOR THE COMMANDER:

M. S. RENEGAR  
Assistant Adjutant General

DISTRIBUTION:  
1 Each Individual

SAMPLE FORMAT (GROUND)

DEPARTMENT OF THE ARMY  
HEADQUARTERS, 2D ARMORED CAVALRY  
APO New York 09266

SAMPLE

AQET-AC-SASF

2 NOVEMBER 1991

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Ground Accident, M1 Tank, Serial Number 2FAF10

1. Under the provisions of DA Pam 385-95 and AR 385-40, the following individuals are appointed to the Ground Accident Investigation Board, effective 30 March 1991.

CPT Richard C. Young, 572-27-1172, USASC, Fort Rucker, AL  
(President)  
CW4 Lisle F. Pickard, 054-36-2803, USASC, Fort Rucker, AL  
(Recorder)  
CPT John Pierce, 231-45-8795, 129th Medical Battalion, APO NY 09145 (Medical Officer)  
CPT Richard Jones, 875-85-9871, 1/34 Armor Bn, APO NY 09765  
(Maintenance Officer)  
SFC Sara Wiggins, 348-69-2746, 1/34 Armor Bn, APO NY 09765  
(Technical Inspector)  
SGT Robert Towers, 345-17-5392, 2/34 Armor Bn, APO NY 09765  
(Tank Commander)  
SP4 William Roberts, 775-90-3496, 2/34 Armor Bn, APO NY 09765  
(Gunner)

2. The purpose of this board is to gather and evaluate evidence, both material and written, which caused or contributed to the accident on 28 March 1991; to recommend action and/or policies which will prevent future accidents and to prepare findings and recommendations in accordance with DA PAM 385-95 and AR 385-40.

3. The board will receive a briefing by the Installation Safety Officer or his representative on conduct and management of the investigation. Individuals will be released from all other duties for full-time participation in the investigation and cannot be removed from this detail except with the approval of the Chief of Staff, V Corps, APO NY 09126.

FOR THE COMMANDER:

GEORGE W. PATTEN  
Assistant Adjutant General

DISTRIBUTION:  
1 Each Individual



CSSC-I

MEMORANDUM FOR Commander, \_\_\_\_\_

SUBJECT: Accident Aircraft Disposition

Aircraft # \_\_\_\_\_ is released to the commander  
of \_\_\_\_\_ for recovery. After completion of an ECOD  
and POL samples for analysis, the aircraft is released for  
disposition.

BOARD PRESIDENT  
U.S. ARMY SAFETY CENTER  
FT. RUCKER, AL

CSSC-I

MEMORANDUM FOR Commander, \_\_\_\_\_

SUBJECT: Accident Vehicle disposition

Vehicle \_\_\_\_\_, # \_\_\_\_\_ is released to the commander  
of \_\_\_\_\_ for recovery after completion of the  
ECOD.

BOARD PRESIDENT  
U.S. ARMY SAFETY CENTER  
FT. RUCKER, AL

CSSC-I

MEMORANDUM FOR Board President, USASC, Fort Rucker, AL 36362

SUBJECT: Certificate of Damage

In accordance with TB 430002-3 (Maintenance Expenditure Limit for Aircraft), aircraft # \_\_\_\_\_ is designated to be damaged beyond economical repair. The current cost of an \_\_\_\_\_ is \$ \_\_\_\_\_.

(MAINTENANCE OFFICER'S SIGNATURE)  
Accident Investigation Board

CSSC-I

MEMORANDUM FOR BOARD PRESIDENT, USAC, Ft Rucker, AL 36362-5363

SUBJECT: Certificate of Damage

In accordance with the Army Master File (AMDF), Vehicle \_\_\_\_\_, # \_\_\_\_\_ is designated to be damaged beyond economical repair. The current cost of an \_\_\_\_\_ is \$ \_\_\_\_\_.

(MAINTENANCE OFFICER'S SIGNATURE)  
Accident Investigator Board

## APPENDIX R

### ELECTROMAGNETIC ENVIRONMENTAL EFFECTS (E<sup>3</sup>) FIELD INVESTIGATION

1. E<sup>3</sup>, formally known as electromagnetic interference (EMI), is a recognized potential cause factor and should be thoroughly evaluated during all accident investigations to determine if E<sup>3</sup> could or could not have influenced the operation of the equipment involved. If E<sup>3</sup> could have been a factor, then it must be rigorously evaluated as a cause factor. E<sup>3</sup> should be considered a potential cause factor for any air or ground system with electronic components, especially modern, complex systems.

2. The following E<sup>3</sup> checklist is recommended for use whenever E<sup>3</sup> is suspected as a cause factor. Use of a checklist will ensure a thorough evaluation of E<sup>3</sup>.

### ELECTROMAGNETIC ENVIRONMENTAL EFFECTS CHECKLIST

1. During the initial stages of the investigation, attempt to determine if there is any evidence of an external influence on the aircraft/vehicle/weapon system or its subsystems. Consider cockpit/instrument indications reported by surviving crewmembers, eyewitness reports, and other physical evidence. This is especially important where the physical evidence indicates that the aircraft/vehicle/weapon system was out of control prior to crash sequence termination.

2. If E<sup>3</sup> can be ruled out as a causal factor during this stage, then note the actions taken to eliminate E<sup>3</sup>. For aviation accidents, document this in paragraph 2k (Special investigation) of the DA Form 2397-3 narrative (i.e., E<sup>3</sup> was considered but ruled out for the following reasons:). For ground accidents, document this in the narrative of DA Form 285.

3. If E<sup>3</sup> cannot be eliminated early on, or there are positive indications of an external influence, advise USASC Systems Management Directorate (SMD) immediately, AV 558-3943/4198, and request technical assistance. In addition, perform the following:

a. Check for High Intensity Radio Transmission Areas (HIRTAs) in the area of the accident. Note VFR sectional or tactical map for large towers (transmitters) within 5 miles of the accident site.

b. While taking aerial photographs of the accident site, recon the area surrounding the accident (5 miles) for large towers (transmitters) such as radio/television, telephone microwave, radar, etc.

(1) All towers (transmitters) are considered a potential source and should be plotted on a diagram in relation to the accident site.

(2) Contact owners of the towers (transmitters) to determine:

(a) Hours of operation.

(b) Nature of transmission(s) (signal power level and frequency).

(c) Signal beam width.

(d) Azimuth(s) of transmitter signal(s).

c. For aviation accidents, gather any and all available ATC tapes, to include radar and voice, for later review.

d. If there are surviving crewmembers, record all cockpit/instrument indications experienced during the accident (i.e., caution/warning/advisory light illumination, audio warning tones, degradation/loss of flight controls, stiffness of pedals, etc.). Compare cockpit/instrument indications with data base of known type aircraft responses to E<sup>3</sup>.

e. If there are no surviving crewmembers, analysis of the above data plus any additional information gained from flight data recorders (if so equipped) will indicate possible contribution to E<sup>3</sup>.

f. Close coordination with SMD will be maintained throughout the E<sup>3</sup> investigation. Detailed analysis of the above data will be conducted at USASC by SMD.

g. E<sup>3</sup> can be eliminated as a causal factor only if accident circumstances (physical evidence, aircraft/vehicle maintenance history, witness statements, etc.) indicate a failed part or human error was the primary cause.

# APPENDIX S

## NIGHT VISION DEVICE (NVD) ACCIDENT REPORTS

(Enter required data using common sense; that is, mark with an "X" or check, or answer the prompt. In all cases, Y=Yes, N=No, U or UNK=Unknown.)

CASE NUMBER: \_\_\_\_\_

INDIVIDUAL COMPLETING FORM: \_\_\_\_\_

### AIRCRAFT DATA

TYPE/TAIL NUMBER: \_\_\_\_\_

WINDSCREEN CONDITION: GOOD \_\_\_\_\_ MED \_\_\_\_\_ POOR \_\_\_\_\_

WINDOWS: CLOSED \_\_\_\_\_ OPEN \_\_\_\_\_

DOORS: COCKPIT: CLOSED \_\_\_\_\_ OPEN \_\_\_\_\_ REMOVED \_\_\_\_\_

CARGO: CLOSED \_\_\_\_\_ OPEN \_\_\_\_\_ REMOVED \_\_\_\_\_

### ENVIRONMENTAL DATA:

MOON: RISE \_\_\_\_\_ SET \_\_\_\_\_

% ILLUM \_\_\_\_\_ ANGLE \_\_\_\_\_

HORIZON: VISIBLE \_\_\_\_\_ OBSTRUCTED \_\_\_\_\_ OTHER \_\_\_\_\_

VISIBILITY: MILES \_\_\_\_\_ RESTRICTIONS: FOG \_\_\_\_\_

MIST \_\_\_\_\_ SMOKE \_\_\_\_\_ OTHER \_\_\_\_\_

TEMPERATURE (Cent): \_\_\_\_\_

DEWPOINT (Cent): \_\_\_\_\_

HUMIDITY: \_\_\_\_\_

DESCRIBE TERRAIN: FLAT \_\_\_\_\_ ROLLING \_\_\_\_\_ MOUNTAINOUS \_\_\_\_\_

BACKGROUND REFLECTANCE: SAND \_\_\_\_\_ DIRT \_\_\_\_\_ GRASS \_\_\_\_\_ WATER \_\_\_\_\_ FOREST \_\_\_\_\_

AREA: REMOTE \_\_\_\_\_ POPULATED \_\_\_\_\_ ISOLATED \_\_\_\_\_ SPARSELY POPULATED \_\_\_\_\_

	<u>NVD's</u>			
	<u>PILOT</u>	<u>COPILOT</u>	<u>CREW CHIEF</u>	
NVG (PVS-5,A,B,C)				
TUBES, NEW OR REBUILT (SAAD)				
TIME ON TUBES (SINCE LAST INSPECTION)				
SERIAL NUMBER ON LEFT TUBE				
SERIAL NUMBER ON RIGHT TUBE				
SERIAL NUMBER OF NVD				
LAST INSP DATE OF NVD AND TYPE TEST SET USED (3895-UV, ALT-TP, HANDHELD)				
DATE OF LAST NITROGEN PURGE LEFT TUBE:				
RIGHT TUBE:				
RECORDS KEPT ON NVD's (Y/N)				
TYPE MOUNTING DEVICE (GX-5, GM-6) MODIFIED FACE PLATE				
TYPE STRAPS USED TO MOUNT NVD's (RUBBER, STRAPS, UNK)				
TYPE COUNTERWEIGHT (SOLID LEAD PAD, LOOSE WEIGHT, NONE, UNK)				
WEIGHT OF COUNTERWEIGHT IN OUNCES				
DID COUNTERWEIGHT BREAK AWAY? (Y/N/U)				
DID COUNTERWEIGHT CONTRIBUTE TO INJURIES? (Y/N/U)				
DID NVD CAUSE OR CONTRIBUTE TO INJURIES? (Y/N/U)				
IF INJURIES OCCURRED, WERE THEY TO EYES/HEAD/FACE/OTHER?				

	<u>PILOT</u>	<u>COPILOT</u>	<u>CREW CHIEF</u>	<u>      </u>
WERE ANY EYEGLASSES WORN?	<u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>
WHAT TYPE OF EYEGLASSES? (GLASS/PLASTIC/POLYCARBONATE)	<u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>
WAS LANYARD WORN AROUND NECK? (Y/N/U)	<u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>
WERE BATTERIES REFRIGERATED BETWEEN USE? (Y/N/U)	<u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>
INDICATE TYPE BATTERY PACK (DUAL, ARTIC ADAPTOR, TRIPLE)	<u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>
TYPE BATTERIES INSTALLED IN NVD OR BATTERY PACK (LITHIUM, MERCURY, ALKALINE)	<u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>
DID CREWMEMBER RECEIVE A LOW BATTERY PER INDICATION? (Y/N/U/NA)	<u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>

#### AUXILLARY LIGHTS

NOTE: ENTER COLOR CODES

G = GREEN NONE:

W = WHITE FINGER:

R = RED LIP:

B = BLUE WRIST:

Y = YELLOW FLASHLIGHT:

#### LIGHTING DATA

FOR POSITION LIGHT: ENTER S (STEADY), F (FLASH)  
 FOR ANTICOLLISION LIGHT: ENTER R (RED), W (WHITE), ST (STROBE)

EXTERNAL: COMPLETED FOR LIGHTS ON. (CHECK AS APPROPRIATE OR ENTER DATA.)

POSITION/NAVIGATION:	BRIGHT	<u>      </u>	DIM	<u>      </u>	UNK	<u>      </u>
ANTICOLLISION LIGHTS:	TOP	<u>      </u>	BOTTOM	<u>      </u>	SIDES	UNK <u>      </u>
INFRARED POSITION LIGHTS:	BRIGHT	<u>      </u>	DIM	<u>      </u>	UNK	<u>      </u>
FORMATION LIGHTS:	ON	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
LANDING LIGHT:	INFRARED	<u>      </u>	VISIBLE	<u>      </u>	WATTAGE	<u>      </u>
	POSITION	<u>      </u>	RHEOSTAT	<u>      </u>		
SEARCHLIGHT:	INFRARED	<u>      </u>	VISIBLE	<u>      </u>	WATTAGE	<u>      </u>
	POSITION	<u>      </u>	RHEOSTAT	<u>      </u>		

BEAM WIDTH IN DEGREES:

LANDING LIGHT/SEARCHLIGHT: FOR POSITION, SPECIFY ANGLE REARWARD (R) OR FORWARD (F) IN RELATION TO VERTICAL AND AZIMUTH; LEFT (L) OR RIGHT (R) OF NOSE (10F/10R). IF LIGHT IS ON CENTERLINE OF NOSE, USE (C) FOR AZIMUTH; E.G., 90R/C (LANDING LIGHT IS STOWED AND ON CENTERLINE)

NVG MODIFICATIONS

YES \_\_\_\_\_ NO \_\_\_\_\_ MWO \_\_\_\_\_  
1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_

RED LIGHTED COMPONENTS: YES \_\_\_\_\_ NO \_\_\_\_\_

TYPE: 1 - EYEBROW COLOR: W = WHITE  
2 - DIMPLE R = RED  
3 - FLOOD B = BLUE  
4 - BEZEL Y = YELLOW  
5 - INTERNAL G = GREEN  
6 - SUPPLEMENTAL

NOTE: - CHECK OFF OR ON  
- ENTER CODES FOR TYPE AND COLOR

PANEL LIGHTS/CONSOLE/OVERHEAD: OFF \_\_\_\_\_ ON \_\_\_\_\_ TYPE \_\_\_\_\_ COLOR \_\_\_\_\_  
AVIONICS LIGHTS: OFF \_\_\_\_\_ ON \_\_\_\_\_ TYPE \_\_\_\_\_ COLOR \_\_\_\_\_  
INSTRUMENT LIGHTS: OFF \_\_\_\_\_ ON \_\_\_\_\_ TYPE \_\_\_\_\_ COLOR \_\_\_\_\_  
MAP LIGHT/UTILITY: OFF \_\_\_\_\_ ON \_\_\_\_\_ TYPE \_\_\_\_\_ COLOR \_\_\_\_\_  
CAUTION/WARNING LIGHTS: OFF \_\_\_\_\_ ON \_\_\_\_\_ TYPE \_\_\_\_\_ COLOR \_\_\_\_\_

NOTE: IF NEEDED, PUT COMMENT ON DA FORM 2397-3.



APPENDIX T

DRIVER TRAINING CHECKLIST/QUESTIONNAIRE

1. INSTRUCTIONS.

- a. Use form as an investigative tool to review the unit's driver training program.
- b. Fill out and give to MAJ Smith (SMD) upon return.
- c. Complete for each driver of vehicle(s) involved in the accident.

2. Review individual's DA Form 348 and SF 46/OF 346 for validity and currency (Use AR 600-55 and FM 55-30 for instructions/maintenance of these forms.) Place comments on the back of this form. NOTE: Include SF 46/OF 346 and DA 348 on the left side of the report.

3. Review adequacy of unit's driver training program (required at battalion level or above). Use AR 385-55, AR 600-55, FM 55-30, and FM 21-17 as a guide. Place comments on the back of this form.

4. Length of time assigned to unit? \_\_\_\_\_ months.

5. Duty position? \_\_\_\_\_

6. Military driving experience?

Accident vehicle \_\_\_\_\_  
Wheeled vehicles: \_\_\_\_\_  
    All tractors \_\_\_\_\_  
    Buses \_\_\_\_\_  
    Sedans/vans \_\_\_\_\_  
    Trucks (less than 2 1/2 ton) \_\_\_\_\_  
    Trucks (over 2 1/2 ton) \_\_\_\_\_  
Tracked vehicles \_\_\_\_\_

7. Estimate total military miles/hours driven. \_\_\_\_\_

8. Was individual licensed during AIT? (Yes/location; No) \_\_\_\_\_

9. Has individual ever received classroom instruction on accident avoidance IAW para B-4, AR 385-55? (Y/yr & mo; No) \_\_\_\_\_

10. Length of time since annual refresher training on accident vehicle? \_\_\_\_\_ months.

11. The following questions pertain to the individual's local driver selection/testing/training procedures.

- a. At what level is the local program being conducted?  
(Battalion, Brigade, Installation, etc.) \_\_\_\_\_
- b. Did procedures include a road test? \_\_\_\_\_ On the accident vehicle? \_\_\_\_\_
- c. Did procedures include operation of auxiliary equipment on accident vehicle? \_\_\_\_\_
- d. Did procedures include emphasis on use of seatbelts? \_\_\_\_\_
- e. Did procedures cover contributory (this accident) factors? (Y, N, N/A)
- f. Is the local program contracted out? \_\_\_\_\_
- g. List qualifications/standards required of the local program supervisor/administrator (include MOS and grade of individual currently assigned) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- h. Are local procedures actually being followed? \_\_\_\_\_
- i. Remarks. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Were NVG's being utilized? \_\_\_\_\_ (If yes, utilize attached NVG checklist).

# APPENDIX U

## U.S. ARMY SAFETY CENTER

### SIMULATOR SICKNESS AVIATION MISHAP DATA SHEET

(NOTE: Complete when a pilot has flown one of the following simulators: UH-60, AH-1, CH-47, AH-64, C-12, U-21 [with visual display], or any simulator with a visual display.)

CASE NUMBER \_\_\_\_\_

PRESIDENT OF BOARD \_\_\_\_\_

AIRCRAFT TYPE \_\_\_\_\_

BOARD FLIGHT SURGEON \_\_\_\_\_

TELEPHONE NUMBER (AV) \_\_\_\_\_

#### CREW STATION

- |                                                                                       | Pilot    | Copilot  |
|---------------------------------------------------------------------------------------|----------|----------|
| 1. Number of days/hours since most recent period in a simulator with visual display * | _____    | _____    |
| * If less than 5 days, continue to question 2.                                        |          |          |
| 2. Date/time of all simulator flight(s) in last 5 days.                               | _____    | _____    |
| 3. Simulator type.                                                                    | _____    | _____    |
| 4. Length of period(s).                                                               | _____    | _____    |
| 5. Did pilot have symptoms of simulator sickness during the period? (Y/N)             | ** _____ | ** _____ |
| 6. Did pilot have symptoms of simulator sickness after the period? (Y/N)              | ** _____ | ** _____ |

\*\* Simulator sickness is a set of symptoms which have been seen during or after exposure to the artificial environment of flight simulators. Symptoms which we would consider diagnostic include: nausea, dizziness either with eyes open or closed, disequilibrium, eyestrain, difficulty focusing eyes, headache, vomiting, sweating, or related symptoms. If yes, please specify symptoms on the reverse side.

Please return form to USASC, Systems Engineering, ATTN: MAJ Crowley, Ft. Rucker, AL 36362 Phone AV 558-3943.

## APPENDIX V

DEPARTMENT OF THE ARMY  
UNITED STATES ARMY SAFETY CENTER  
FORT RUCKER, ALABAMA 36362-5363

CSSC-I

8 FEB 1990

### MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Letter of Instruction (Safety Investigations of Chemical Events)

#### 1. Situation.

a. Historically, Army Materiel Command (AMC) has been tasked by Department of the Army through Army regulations and directives to respond to chemical events and to conduct the safety investigation.

b. With the passing of Public Law 99-145, which requires the destruction of the U.S. stockpile of unitary lethal chemical agents and munitions, the military community has revisited responsibilities as outlined in current regulations for response to chemical events. As a result, regulations and DA pamphlets are being revised and the attached message (Tab A, change to AR 385-40) bridges the gap for the interim. These changes have impacted the Director of Army Safety (DASAF), the United States Army Safety Center (USASC), and the USASC Investigation Directorate.

2. Mission. The USASC Investigation Directorate will conduct safety investigations of all class A and B chemical events and will be prepared to conduct safety investigations or provide investigative assistance to other chemical events as directed by the Commanding General, USASC.

3. Concept. Upon notification of a chemical event, the Investigation Directorate will assemble a safety investigation team from within USASC and other agencies/commands and prepare for deployment. The Army Safety Office (ASO) will initiate coordination for a general officer (GO) board president, if required. A Chemical Accident/Incident Response and Assistance team (CAIRA) Response Force, under the provisions of AR 50-6 and DA Pam 50-XX (Draft), will precede the safety investigation team to the event site. Therefore, the actual deployment time for the USASC team will be coordinated by the Deputy DASAF through ODCSOPS, with the Response Force. ACCESS TO THE EVENT SITE WILL BE GRANTED BY THE COMMANDER RESPONSIBLE FOR CAIRA OPERATIONS.

CSSC-I

SUBJECT: Letter of Instruction (Safety Investigations of Chemical Events)

a. Responsibilities:

(1) Commanding General, USASC, is responsible for the safety investigation of all class A and B chemical events and has the option to conduct a safety investigation of other chemical events as deemed appropriate.

(2) Director, Investigation Directorate, is responsible for identification, training, deployment, and support of investigation teams, to include preparation for the conduct of the investigation.

(3) The ASO will provide staffing support, as required, during exercises or actual deployment to an event site. In addition, the ASO will keep Investigation Directorate informed of policy and operational issues and plans, and will ensure that the Army Operations Center (AOC) has appropriate notification rosters for USASC Operations and key personnel.

(4) Other USASC directorates will support the Investigation Directorate, as required, during exercises and/or actual deployment to an event site.

(5) Chief, Investigation Division, will maintain notification checklists, point of contact lists, deployment kits, and as a MINIMUM, three fully-trained teams to respond to chemical events. (A likely team composition is shown at Tab B.) In addition:

(a) Appoint, on orders, a chemical event action officer, responsible for monitoring team training programs and administering requirements in support of the directorate's mission.

(b) Ensure that selected team members have current blood cholinesterase (ChE) on file in USASC Operations.

(c) Ensure that team members have been pre-fitted for a protective mask, and that each team member's size is on file in deployment kits.

b. Coordinating instructions:

(1) Notification to USASC of a chemical event will be made by the AOC.

CSSC-I

SUBJECT: Letter of Instruction (Safety Investigations of Chemical Events)

(2) After notification of a chemical event, Operations will give first priority to notifying the Chief, Investigation Division; Director, Investigation Directorate, Deputy Commander, USASC, Commanding General, USASC; and USASC Public Affairs Officer (PAO).

(a) A team will be selected by Chief, Investigation Division, and placed on standby.

(b) The ASO will assist in coordinating team members from TSG, ODCSLOG, ODCSOPS, and the MACOMs.

(3) If a chemical event occurs, it is highly probable that a GO will be appointed as board president by the Chief of Staff, Army (CSA). If that option is selected by the CSA, the ASO will coordinate the staffing requirements with the General Officer Management Officer (GOMO); Director of Army Staff; Vice Chief of Staff, Army; and CSA for selection of the GO.

(a) Operations will maintain two GO information books that will familiarize the GO selected with USASC and the investigative process.

(b) One GO information book will be maintained in the ASO.

(4) Once a GO is selected, the Director, Investigation Directorate, will make initial contact with the GO selected and coordinate travel requirements.

(5) The senior investigator deployed to the event site will brief the GO upon his arrival as to the status of the team and special requirements.

(6) The USASC PAO will make contact with the CAIRA Response Force PAO as soon as possible after notification of an event.

(7) Requests from the media or public concerning the safety investigation will be coordinated between the USASC PAO and the Response Force PAO. The Response Force PAO will be the primary coordinator of information concerning the chemical event.

(8) Release of chemical event safety investigation board reports (including technical reports) to contractors and persons not employed by the U.S. Army is strictly forbidden unless prior approval is given by the Commanding General, USASC.

CSSC-I

SUBJECT: Letter of Instruction (Safety Investigations of Chemical Events)

#### 4. Logistics/Deployment.

a. Deployment kits will be maintained in Operations under the direct supervision of the Operations officer. As a minimum, kits will contain appropriate regulations and directives, investigator blood ChE analysis, and pre-obtained information about the accident site/area.

b. Special protective equipment (including masks) will be provided by the supported command and/or CAIRA Response Force.

c. Mode of deployment (for planning only):

(1) Within Alabama: military aircraft (primary)  
rental van or government van  
(secondary)

(2) Within CONUS: military aircraft (primary)  
civilian aircraft (secondary)

(3) OCONUS: civilian aircraft (primary)

#### 5. Command/Communication.

a. Upon arrival at the event site, the board president, or his duly appointed representative, will report to the commander responsible for CAIRA operations and inform him of the team's composition, status, and support requirements.

b. Board presidents will ensure that USASC Operations is, as a minimum, updated on the progress of the investigation at least twice during a 24-hour period: at 0730 CST and at 1600 CST.

c. Cellular phones will be part of the deployment kit when practicable. Probable sites for deployment are listed at Tab C. Those sites with an asterisk are located near metropolitan areas that have cellular phone communication capability. However, for OPSEC purposes, prior to using cellular phones for reporting, the board president will coordinate with the CAIRA Information Systems Officer to ensure COMSEC is not violated.

CSSC-I

SUBJECT: Letter of Instruction (Safety Investigations of Chemical Events)

(Original signed)

4 Encls

1. DA Msg 231420Z Jan 90
2. Team Composition
3. Potential Deployment Sites
4. References

C. A. HENNIES  
Brigadier General, USA  
Commanding

DISTRIBUTION:

Dep Dir of Army Safety

Dep Cdr, USASC

Dir, SMD

Dir, DOIM

Dir, M&M

Cmdt, ALC

Ch, RMO

ODCSOPS, Nuc/Chem Div

USANCA, Belvoir Proving Gnds

GOMO



**TAB A**

UNCLASSIFIED

01 10 231420Z JAN 90 PP PP UUUU

DA WASH DC//DAMO-SWS//

AIG 9898

ZEN DA WASH DC //SGPS-PSP/SAIL-CO/SAIL-ESO/DACS-SF/  
/DAMO-SWC/DALO-SMA-EOD/SAIG-TI//

UNCLAS

SUBJECT: POLICY CHANGE AFFECTING AR 50-6 AND AR 385-40 (U)

- A. HQDA DAMO-SWS 3012220Z AUG 89 SAB
- B. AR 50-6 13 NOV 86
- C. AR 385-40 1 APR 87
- D. AR 385-64 22 MAY 87
- E. AR 380-86 15 MAR 84
- F. HQDA DAPE-HRS 191049Z JUN 87 SAB
- G. HQDA DAMO-SW 121254Z NOV 87, SUBJ: POLICY CHANGE AFFECTING AR 50-6  
CHEMICAL ACCIDENT/INCIDENT REPORTING REQUIREMENTS
- G. SB 742-1 APPX B
- 1. DUE TO PUBLIC VISIBILITY AND INCREASED CONGRESSIONAL CONCERN, THIS  
CHANGE TO AR 50-6 AND AR 385-40 IS PROMULGATED. EFFECTIVE IMMEDIATELY,  
AR 50-6 IS CHANGED AS FOLLOWS:  
--BEGIN CHANGE TO AR 50-6--

C.M. HOLMES, MAJ, GS

DAMO-SWS, 7-5687

*Allan D. Robb*  
L.J. DEL ROSSO, MG, DAMO-SW, 4-9015

UNCLASSIFIED

02 10

JAN 90 PP PP UUUU

RESCIND: PARA 5-2 (EXPLANATION OF CAIRA TERMS), PARA 5-7 (ACCIDENT AND INCIDENT REPORTING PROCEDURES), FIG 5-1; REF F; AND REF G.

PARA 5-2. EXPLANATION OF CAIRA TERMS

A. CHEMICAL EVENT. THE TERM CHEMICAL EVENT APPLIES TO:

(1) CHEMICAL AGENT LEAKS OF MUNITIONS IN THE CHEMICAL AGENT STOCKPILE.

(2) REQUIREMENTS FOR EMERGENCY TRANSPORTATION AND/OR DISPOSAL OF KNOWN OR SUSPECTED CHEMICAL AGENTS OR MUNITIONS.

(3) ANY RELEASE OF CHEMICAL AGENT TO THE ENVIRONMENT OUTSIDE OF CLOSED SYSTEMS, FACILITIES, OR DEVICES (I.E., LAB HOOD, GLOVE BOX, MUNITIONS, BULK CONTAINER WHICH ARE SPECIFICALLY DESIGNED TO CONTAIN CHEMICAL AGENT) GREATER THAN ESTABLISHED U.S. ARMY SURGEON GENERAL AIRBORNE EXPOSURE STANDARDS (AS PER DOD LOSS-9 STANDARDS PROMULGATED IN AR 385-64), OR RELEASE RESULTING IN PERSONNEL EXHIBITING CLINICAL SIGNS OR SYMPTOMS OF CHEMICAL AGENT EXPOSURE.

(4) ANY EXPOSURE OR RELEASE OF AGENT WHICH DOES NOT EXCEED ESTABLISHED U.S. ARMY SURGEON GENERAL AIRBORNE EXPOSURE STANDARDS, BUT NONETHELESS IS RECEIVING MEDIA ATTENTION.

(5) ANY DELIBERATE RELEASE OF CHEMICAL AGENT RESULTING FROM A TERRORIST OR CRIMINAL ACT (INCLUDING EMPLOYMENT OF AN IMPROVISED

C.M. HOLMES, MAJ, GS

DAMO-SWS, 7-5698



L. J. DEL ROSSO, MG, DAMO-SW, 4-9015

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CHEMICAL DEVICE INTENDED TO DISPERSE CHEMICAL AGENT REGARDLESS OF WHETHER DEVICE HAS FUNCTIONED OR NOT}.


{6} LOSS OF CHEMICAL SURETY MATERIAL {CSM} {OTHER THAN DELIBERATE DESTRUCTION BY APPROVED, AUTHORIZED LABORATORY AND DEMILITARIZATION PROCESSES, INCLUDING TRAINING EXPENDITURES}.

{NOTE: CHEMICAL EVENTS {AS OUTLINED ABOVE} WHICH INVOLVE RELEASE OF, OR EXPOSURE TO CHEMICAL AGENTS, WHETHER CLASSIFIED AS CSM OR EXPERIMENTAL, ARE REPORTABLE.}

B. STANDARD CHEMICAL EVENT EMERGENCY NOTIFICATION SYSTEM. WHEN A CHEMICAL EVENT RESULTS IN THE RELEASE OF AGENT, THE PRESERVATION OF LIFE AND LIMB IS OF PARAMOUNT CONCERN. IMMEDIATE ACTION MUST BE TAKEN TO NOTIFY AND PROTECT PERSONNEL IN THE PREDICTED HAZARD AREA. THE CRITERIA TO MAKE THIS NOTIFICATION WILL BE BASED ON PREDICTED DOSAGE AND DISTANCES. THE PREDICTED DOWNWIND DISTANCE OF THE CHEMICAL AGENT NO-EFFECT DOSAGE WILL BE THE SPECIFIC CRITERIA USED. A MINIMUM OF THREE LEVELS OF PREDICTED SEVERITY WILL BE USED TO NOTIFY OFF-POST OFFICIALS AND WILL BE INCLUDED IN FORMAL NOTIFICATION MADE TO HQDA. FOR EMERGENCY RESPONSE PURPOSES, THESE LEVELS WILL BE IDENTIFIED AS:

{1} LIMITED AREA EMERGENCY. THIS LEVEL WILL BE DECLARED WHEN THE PREDICTED CHEMICAL AGENT NO-EFFECTS DOSAGE DISTANCE

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DOES NOT EXTEND BEYOND THE CHEMICAL LIMITED AREA WHERE THE CHEMICAL EVENT OCCURRED. {LEAST SEVERE}

{2} POST ONLY EMERGENCY. THIS LEVEL WILL BE DECLARED WHEN THE PREDICTED CHEMICAL AGENT NO-EFFECTS DOSAGE DISTANCE EXTENDS BEYOND THE CHEMICAL LIMITED AREA, BUT DOES NOT EXTEND BEYOND THE POST/INSTALLATION BOUNDARY.

{3} COMMUNITY EMERGENCY. THIS LEVEL WILL BE DECLARED WHEN THE PREDICTED CHEMICAL AGENT NO-EFFECTS DOSAGE DISTANCE EXTENDS BEYOND THE POST/INSTALLATION BOUNDARY. {MOST SEVERE}.

PARA 5-7. CHEMICAL EVENT REPORTING PROCEDURES.

{1} CHEMICAL EVENTS WILL BE REPORTED DIRECTLY TO HQDA. PROCEDURES ARE AS FOLLOWS:

{A} INSTALLATION COMMANDERS WILL ENSURE IMMEDIATE DIRECT TELEPHONIC NOTIFICATION IS MADE WITHIN THREE {3} HOURS, FROM THE TIME THE CHEMICAL EVENT HAS BEEN IDENTIFIED, TO HQDA. IN THE CASE OF CHEMICAL AGENT RELEASE, INSTALLATIONS ARE RESPONSIBLE FOR NOTIFYING LOCAL/STATE EMERGENCY RESPONSE CENTERS AND OFFICIALS WHO ARE RESPONSIBLE FOR AFFECTED ON/OFF-POST AREAS. AS COORDINATED AND ESTABLISHED IN THEIR CAIRA PLANS. {NOTE: NON-STOCKPILE ITEMS WHICH ARE FOUND OFF POST WILL BE REPORTED TO HQDA BY THE FIRST DOD OFFICIAL

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TO RESPOND/ARRIVE ON SCENE, FOR EXAMPLES: EXPLOSIVE ORDNANCE OR  
TECHNICAL ESCORT PERSONNEL. CHEMICAL AGENT RESEARCH AND DEVELOPMENT  
CONTRACTORS WILL REPORT, AS SPECIFIED IN THEIR NEGOTIATED CONTRACT, TO  
EITHER THE U.S. ARMY MEDICAL RESEARCH INSTITUTE OF CHEMICAL DEFENSE OR  
U.S. ARMY CHEMICAL RESEARCH, DEVELOPMENT AND ENGINEERING CENTER, WHO  
WILL THEN MAKE NOTIFICATION TO HQDA.}

{B} REPORTS WILL BE MADE TO THE ARMY OPERATIONS CENTER  
{AOC}, AV 227-0218 OR COM {202} 697-0218.


{C} CHEMICAL EVENTS WILL BE REPORTED LISTING THE FORMAT  
AT FIGURE 5-1, PROVIDING AS MUCH INFORMATION AS IS CURRENTLY AVAILABLE.  
REPORT SUBMISSION WILL NOT BE DELAYED DUE TO LACK OF INFORMATION.

{NOTE: THIS ALSO APPLIES TO NON-STOCKPILE ITEMS WHICH ARE FOUND BOTH  
ON AND OFF POST.}

{D} INITIAL WRITTEN NOTIFICATION WILL BE PROVIDED {BY  
ELECTRICALLY TRANSMITTED MESSAGE} AS ADDITIONAL INFORMATION BECOMES  
AVAILABLE, BUT NO LATER THAN 24 HOURS AFTER INITIAL VERBAL NOTIFICATION  
OF THE CHEMICAL EVENT IS MADE. SUPPLEMENTAL REPORTS WILL BE SENT  
DAILY, THEREAFTER.

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{E} EXERCISE AND TEST REPORTS WILL BE IDENTIFIED AT THE BEGINNING AND END WITH THE PHRASE "THIS IS A TRAINING EXERCISE {EXERCISE NAME}".

{Z} CHEMICAL EVENT REPORTS WILL BE:

{A} CLASSIFIED IN ACCORDANCE WITH AR 380-86.

{B} DISPATCHED TO:

1/ HQDA WASH DC//DAMO-SWS/DAMO-SWC/DALO-SMA-EOD/DACS-SF/DAMO-ODL/SGPS-PSP/SAIG-TI//.

2/ CDRUSANCA FT BELVOIR VA//MONA-SU/MONA-CM//.

3/ CDRAMC ALEX VA//AMCCN-C//.

4/ DIRAMC FSA CHARLESTOWN IN//AMXOS//.

5/ PM CML DEMIL APG MD//SAIL-PM/SAIL-PMS//.

6/ OTHER MAJOR ARMY COMMANDERS, AS APPROPRIATE.

{C} OCCUPATIONAL ILLNESSES {DA MILITARY OR CIVILIAN PERSONNEL} RESULTING FROM CHEMICAL EVENTS WILL ALSO BE REPORTED {AS PRESCRIBED IN AR 40-400, PARA 6-10}.

FIGURE 5-1.

{CLASSIFY REPORT AS PER AR 380-86}

HEADER: "THIS IS A CHEMICAL EVENT REPORT.

BODY: {1} DATE AND TIME {LOCAL} OF EVENT.

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{2} LOCATION.

{3} QUANTITY AND TYPE OF WEAPON(S) OR CONTAINER(S),  
AND CHEMICAL AGENTS INVOLVED.

{4} DESCRIPTION OF WHAT HAS HAPPENED. (INCLUDE  
STATEMENT OF WHETHER CHEMICAL EVENT IS A RESULT OF NON-DELIBERATE OR  
DELIBERATE ACTION. IF NOT APPLICABLE, SO STATE.)

{5} EMERGENCY NOTIFICATION LEVEL (I.E., LIMITED AREA  
EMERGENCY, POST ONLY EMERGENCY, COMMUNITY EMERGENCY. IF NOT  
APPLICABLE, SO STATE.)

{6} DESCRIPTION OF PROPERTY DAMAGE.

{7} PERSONNEL CASUALTIES/INJURIES.

{8} WHETHER OFF-POST MEDICAL SERVICES AND/OR  
FACILITIES WERE REQUIRED.

{9} STATE IF SERVICE RESPONSE FORCE COMMANDER IS  
REQUIRED.

{10} ASSISTANCE REQUIRED (E.G., AUGMENTATION FORCES OF  
ANY TYPE, EOD, SECURITY FORCES, EQUIPMENT, MATERIALS).

{11} ANY OTHER PERTINENT INFORMATION (E.G., IF NEWS  
RELEASE WAS ISSUED, SAFETY AND SECURITY MEASURES TAKEN).

{12} COMMANDER'S ASSESSMENT OF THE SITUATION.

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{13} WHEN THIS REPORT IS USED FOR REPORTING EMERGENCY DISPOSAL OF HAZARDOUS MUNITIONS (E.G., SUSPECTED CHEMICAL MUNITIONS/MATERIAL), REPORTING AGENCIES MUST ADD THE FOLLOWING:

{A} TYPE OF AIR SAMPLERS/TEST KITS USED AND RESULTS OBTAINED.

{B} TYPE/AMOUNT OF EXPLOSIVE USED TO DESTROY EACH MUNITION.

NOTE: EXCEPTION TO REPORTING FORMAT: REPORTS CONCERNING LEAKING MUNITIONS IN THE CHEMICAL STOCKPILE WILL BE MADE IAW SB 742-1, APPENDIX B.

--END CHANGE TO AR 50-6--

2. REF B, CHAP 7, CHEMICAL AGENT ACCIDENTS AND INCIDENTS, AS AMENDED BY REF D, IS RESCINDED. AR 385-40 IS CHANGED AS FOLLOWS:

--BEGIN CHANGE TO AR 385-40--

PARA 7-1. GENERAL. COMMAND RESPONSIBILITIES. COMMANDERS WILL INVESTIGATE AND REPORT ALL CHEMICAL EVENTS INVOLVING CHEMICAL COMPOUNDS INTENDED FOR USE IN MILITARY OPERATIONS TO KILL, SERIOUSLY INJURE, OR INCAPACITATE PERSONS THROUGH THEIR CHEMICAL PROPERTIES. EXCLUDED ARE RESEARCH, DEVELOPMENT, TEST, AND EVALUATION (RDTE) DILUTE SOLUTIONS; RIOT CONTROL AGENTS; CHEMICAL DEFOLIANTS AND HERBICIDES; SMOKES; FLAMES;

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MILITARY EXPLOSIVES; AND INCENDIARIES. PESTICIDES, INSECTICIDES, AND INDUSTRIALLY MANUFACTURED CHEMICALS, UNLESS SELECTED BY THE ARMY FOR CHEMICAL WARFARE PURPOSES, ARE ALSO EXCLUDED.

PARA 7-2. CHEMICAL EVENT INVESTIGATION PROCEDURES. ALL ARMY CHEMICAL EVENTS WILL BE INVESTIGATED FOR THE PURPOSE OF ACCIDENT PREVENTION, WHETHER OR NOT COLLATERAL INVESTIGATIONS ARE CONDUCTED. CHEMICAL EVENTS WHICH MEET CRITERIA FOR CLASS A OR B ARMY ACCIDENTS (AR 385-40, PARA 2-3), OR INVOLVE OFF-POST CONTAMINATION (I.E., THE PREDICTED/ACTUAL CHEMICAL AGENT NO EFFECTS DOSAGE DISTANCE EXTENDS BEYOND THE POST/INSTALLATION BOUNDARY) WILL BE INVESTIGATED BY A LIMITED USE ACCIDENT INVESTIGATION BOARD AS DETERMINED BY THE HQDA DIRECTOR OF ARMY SAFETY; HOWEVER, DEPENDING ON THE SITUATION, ANY OTHER TYPE OF CHEMICAL EVENT MAY ALSO WARRANT HQDA INVESTIGATION. MACOMS WILL MAKE PROVISIONS TO INVESTIGATE ALL OTHER CHEMICAL EVENTS. MACOMS WILL ESTABLISH PROCEDURES TO ENSURE A TECHNICAL INVESTIGATION OR REVIEW/ANALYSIS APPROPRIATE TO THE SEVERITY/CONSEQUENCES OF THE EVENT IS PROMPTLY CONDUCTED AND REPORTED. A REPORT WILL BE FORWARDED, WITHIN 90 DAYS OF THE EVENT TAKING PLACE, TO THE FOLLOWING: HQDA, OFFICE OF THE CHIEF OF STAFF, ATTN: DACS-SF, WASHINGTON DC 20310-0200, AND AMC FIELD SAFETY ACTIVITY, AMXOS-C, CHARLESTOWN, IN 47111.

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PARA 7-3. RELEASE OF INFORMATION. RELEASE OF CHEMICAL EVENT INVESTIGATION BOARD REPORTS AND TECHNICAL INVESTIGATIONS TO CONTRACTORS AND PERSONS NOT EMPLOYED BY THE U.S. ARMY IS STRICTLY FORBIDDEN UNLESS PRIOR APPROVAL IS GIVEN BY THE COMMANDER, UNITED STATES ARMY SAFETY CENTER.

PARA 7-4. EXCHANGE OF INFORMATION. MACOMS AND THE PROGRAM MANAGER FOR CHEMICAL DEMILITARIZATION WILL ESTABLISH PROCEDURES TO EXCHANGE INFORMATION (COPY FURNISHED TO DACS-SF) ON CHEMICAL EVENTS WHICH HAVE LESSON-LEARNED VALUE FOR OTHER CHEMICAL ACTIVITIES.

--END CHANGE TO AR 385-40--

B. THIS IS A COORDINATED SURETY AND ARMY SAFETY MESSAGE. HQDA POCs: (AR 50-6) MAJ HOLMES, DAMO-SWS, AV 227-5698, OR COM (202) 697-5698 AND (AR 385-40) MR FATZ, DACS-SF, AV 225-7291, OR COM (202) 695-7291.

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POTENTIAL TEAM COMPOSITION - MEMBERS/ADVISORS

(Dependent on Event)

<u>ORGANIZATION</u>	<u>POSITION</u>
TBD	Board President (GO) (ASO will assist in coordination)
USASC (ID)	Primary Asst to Board President (04/05)
USASC (ID)	Recorder/Materiel Work Group Leader (MW4/CW4)
USASC (ID)	Human Factors Work Group Leader (DAC)
USASC (ALC)	Industrial Hygienist (or)
USASC (ALC)	Subject Matter Expert
MACOM/INDUSTRY	Technical Advisors (ASO will assist in coordination)
TSG	Medical Officer (ASO will assist in coordination)
USANCA	Technical Advisor (ASO will assist in coordination)
ODCSOPS	Technical Advisor (ASO will assist in coordination)
ODCSLOG	Quality Assurance (ASO will assist in coordination)
	Specialist/Ammo
	Specialist (QASAS)
PM CHEM DEMIL	Technical Advisor (ASO will assist in coordination)

### POTENTIAL DEPLOYMENT SITES

- \*1. Aberdeen Proving Ground, Aberdeen, Maryland
- \*2. Anniston Army Depot, Anniston, Alabama
- \*3. Lexington - Blue Grass Army Depot, Lexington, Kentucky
- 4. Newport Army Ammunition Plant, Newport, Indiana
- 5. Pine Bluff Arsenal, Pine Bluff, Arkansas
- 6. Pueblo Depot Activity, Pueblo, Colorado
- 7. Tooele Army Depot, Tooele, Utah
- 8. Dugway Proving Ground, Dugway, Utah
- 9. Umatilla Depot Activity, Hermiston, Oregon
- \*10. Fort McClellan, Fort McClellan, Alabama
- 11. U.S. Army Chemical Activity, WESTCOM, Johnson Island
- 12. Federal Republic of Germany (FRG)

### REFERENCES

AR 50-6                    Chemical Surety, dtd 12 Nov 86

DA Pam 50-XX            Chemical Accident/Incident Response and Assistance  
                          (CAIRA) Operations (Draft)

AR 385-40                Accident Reporting and Records, dtd 1 Apr 89

DA Msg 231420Z        Subject: Policy Change Affecting AR 50-6 and  
Jan 90                    AR 385-40

AR 385-61                The Army Toxic Chemical Agent Safety Program

DA Pam 385-61        Toxic Chemical Agent Safety Program

APPENDIX W

DEPARTMENT OF THE ARMY  
UNITED STATES ARMY SAFETY CENTER  
FORT RUCKER, ALABAMA 36362-5363

CSSC-R

14 December 1989

MEMORANDUM FOR ALL RESEARCH, ANALYSIS, AND INVESTIGATION  
DIRECTORATE (RAID) PERSONNEL

SUBJECT: Raid Policy #6, Accident Investigation Witness Statement  
Promises of Confidentiality

1. The attached enclosures provide information that will be READ to all witnesses interviewed during USASC field investigations from this date on. A handout of the General Use Investigations enclosure will be provided all persons being interviewed.
2. Confidentiality will be offered when there is a limited use accident investigation. When confidentiality is offered, also provide a copy of the Limited Use Investigations handout explaining confidentiality.
3. The intent of this policy is to standardize procedures and to fulfill our responsibility by ensuring that all personnel interviewed are fully aware of their rights pursuant to an AR 385-40 investigation.

(Original signed)

2 Encls

WILLIAM G. STOLARCEK  
COL, AV  
Director, RAID

U.S. ARMY SAFETY CENTER  
WITNESS INFORMATION HANDOUT

GENERAL USE INVESTIGATIONS

1. This accident investigation board was convened under the provisions of AR 385-40 for the purpose of conducting a safety investigation.
2. There may be several investigations concerning this accident, to include the safety investigation and other collateral or legal investigations. These other investigators are required to inform you of their purpose and your legal rights.
3. The purpose of the safety investigation is for accident prevention purposes only within DOD channels, and by Army regulation, it cannot be used for any other purpose, to include future disciplinary action. Therefore, the interview you are being asked to give will be used by the Army only for safety or accident prevention purposes.
4. This witness interview may be released to the public (for example: newspapers, attorneys, etc.) pursuant to a Freedom of Information Act request for the accident investigation report.
5. Even if you provide a statement, the chain of command will review the final accident report, which may include your interview, but the chain of command may only use the safety report and the interview for accident prevention purposes.
6. If you ever have knowledge that your witness interview was used by the Army for anything other than accident prevention purposes (for example, disciplinary action against an individual), you should consult with your local Judge Advocate Defense Counsel Office and request that the Command Judge Advocate, U.S. Army Safety Center, be notified immediately at AV 558-3960 or Com (205) 255-3960.



U.S. ARMY SAFETY CENTER  
WITNESS INFORMATION HANDOUT

LIMITED USE INVESTIGATIONS\*

1. This accident investigation board was convened under the provisions of AR 385-40 for the purpose of conducting a safety investigation.
2. There may be several investigations concerning this accident, to include the safety investigation and other collateral or legal investigations. These other investigators are required to inform you of their purpose and your legal rights.
3. The purpose of the safety investigation is for accident prevention purposes only within DOD channels, and by Army regulation, it cannot be used for any other purpose, to include future disciplinary action. Therefore, the interview you are being asked to give will be used by the Army only for safety or accident prevention purposes.
4. The promise of confidentiality is available to you if you want it.
5. Nonconfidential witness interviews may be released to the public (for example, newspapers, attorneys, etc.) pursuant to a Freedom of Information Act request for the accident investigation report. Confidentiality means your interview will not be released to the public or outside DOD channels unless there is a specific federal court order.
6. Even if you provide a statement (confidential or nonconfidential), the chain of command will review the final accident report, which may include your interview, but the chain of command may only use the safety report and the interview for accident prevention purposes.
7. If you ever have knowledge that your confidential witness interview was used by the Army for anything other than accident prevention purposes (for example, disciplinary action against an individual), you should consult with your local Judge Advocate Defense Counsel Office and request that the Command Judge Advocate, U.S. Army Safety Center, be notified immediately at AV 558-3960 or Com (205) 255-3960.

\*Confidentiality can be offered if this is a limited use accident investigation which involves aviation accidents or other complex weapons systems or equipment accidents when the determination of causal factors is vital to the national defense.

## APPENDIX X

### AVIATION ACCIDENT COMMAND CLIMATE INDICATORS

- What is the crew, PIC, flight lead selection process in the unit?
- What is the UT selection process in the unit?
- How are aviators distributed within a unit?
  - Are senior aviators (CW3/4, MW4) and/or IPs equally distributed throughout the organization to the extent possible?
- Is the commander and/or platoon leader (or appropriate leader) current and proficient in the aircraft and equipment assigned to his unit, e.g., NVGs?
- Does the unit perform its mission requirements without "surging" on a continuing basis?
  - If not, why not? Is it because of:
    - Management (operations, aviation maintenance, personnel)?
    - Leadership?
    - Mission requirements out of balance with resources?
    - Everything #1 priority?
- Does the pace of the unit operations and mission requirements appear excessive or out of line with available resources?
  - Crawl, walk, run concept appear sound?
- From the flight surgeon's perspective, are the aviators healthy (mentally and physically)?
  - Are the same aviators in the unit incurring the accidents?
- Are training programs in line with the unit mission?
  - What is the unit's NVG training program?
- What is the IP-to-pilot ratio in the unit?
- Is the unit experiencing difficulties in meeting various currency requirements (i.e., NVG)?
- Is RL progression within the unit on track?

- What has been the aviator turnover rate for the past year?  
(PCS, TDY, retire, etc.)
- Does the unit have sufficient pilots to man their aircraft or  
are they forced to cross-level among units?
- Are there sufficient crew chiefs in the unit?
- What is the utilization rate for aircraft mechanics on a day-  
to-day basis?

### NON-AVIATION ACCIDENT COMMAND CLIMATE INDICATORS

- What is the crew, tank commander, driver selection process in the unit?
- How are NCOs (E5 through E9) distributed within a unit?
  - Are senior NCOs equally distributed throughout the organization to the extent possible?
  - What is the authorized versus on-hand strength?
- Is the commander and/or platoon leader (or appropriate leader) current and proficient in the equipment assigned to his unit, e.g., NVGs?
- Does the unit perform its mission requirements without "surging" on a continuing basis?
  - If not, why not? Is it because of:
    - Management (operations, maintenance, personnel)?
    - Leadership?
    - Mission requirements out of balance with resources?
    - Everything is #1 priority?
- Does the pace of the unit operations and mission requirements appear excessive or out of line with available resources?
  - Crawl, walk, run concept appear sound?
- From the medical doctor's perspective, are the soldiers healthy (mentally and physically)?
- Are training programs in line with the unit mission?
  - What is the unit's NVG training program?
- Is the unit experiencing difficulties in meeting various currency requirements, i.e., NVG?
- What has been the leadership turnover rate for the past year? (PCS, TDY, retire, etc.)
- Does the unit have sufficient soldiers to man their equipment or are they forced to cross-level among units?
- Are there sufficient mechanics in the unit?
- What is the utilization rate for mechanics on a day-to-day basis?

## APPENDIX Y

### WRECKAGE DISTRIBUTION DIAGRAM

1. The Wreckage Distribution Diagram depicts the location of all aircraft components in their postcrash positions. The locations should be shown relative to the flight path of the aircraft just prior to impact (Ref DA Pam 385-95, para 8-9). Diagramming of the crash site should begin as soon as possible after arrival at the accident site. No one should be allowed into the secured area until the locations of all components are accounted for and marked. Make sure that all parts or pieces are accounted for and diagrammed. The Wreckage Distribution Diagram is usually the responsibility of the Materiel Factors group leader. A sample checklist is contained on page 2-39 (Ref DA Pam 385-95, para 6-4 and 8-7).

2. The following pages are a sample checklist to follow for the Wreckage Distribution Diagram.

- \_\_\_\_\_ 1. Has arrangement been made for facility engineers to plot wreckage?
- \_\_\_\_\_ 2. Has the wreckage distribution plot been initiated?
- \_\_\_\_\_ 3. Does the wreckage distribution plot show location of all aircraft components in their postcrash position relative to the flight path of aircraft just prior to impact?
- \_\_\_\_\_ 4. Does the wreckage distribution plot show all terrain marks made by aircraft in the crash sequence; i.e., earth gouge depth, length and width, snow or earth pushed in front of the aircraft, etc.?
- \_\_\_\_\_ 5. Does the wreckage distribution plot show a plane and profile view?
- \_\_\_\_\_ 6. Does the wreckage distribution plot show rollover, nose over, or movement along crash path by curved arrows?
- \_\_\_\_\_ 7. Have all components, terrain marks, obstacles, witnesses, terrain features been surveyed to give distance and azimuth from the main wreckage?
- \_\_\_\_\_ 8. Does the wreckage distribution plot show the major impact of the aircraft?
- \_\_\_\_\_ 9. Does the wreckage distribution plot show the secondary impact(s) of the aircraft?
- \_\_\_\_\_ 10. Does the wreckage distribution plot show the location of eyewitnesses?
- \_\_\_\_\_ 11. Is the wreckage distribution plot complete and accurate?
- \_\_\_\_\_ 12. Have the locations of all occupants been determined?
- \_\_\_\_\_ 13. Has flight control and setting been determined and noted; i.e., controls, radios, autopilot, flaps, etc?
- \_\_\_\_\_ 14. Has the flight path been determined?
- \_\_\_\_\_ 15. Has flight altitude prior to accident descent been determined?
- \_\_\_\_\_ 16. Has flight attitude prior to accident descent been determined?
- \_\_\_\_\_ 17. Have the lateral and longitudinal attitudes at ground impact been determined?

- \_\_\_\_\_ 18. Has the speed at impact been determined? G-forces?
- \_\_\_\_\_ 19. Has the angle of impact been determined?
- \_\_\_\_\_ 20. Has the angle from obstacle to initial ground impact been determined?
- \_\_\_\_\_ 21. Has the distance of travel and of structural displacement from initial impact been accurately measured?
- \_\_\_\_\_ 22. Has the manner of flight (straight, cart-wheeling, etc.) after impact been determined?

## **APPENDIX Z**

### **INVESTIGATION OF AIRCREW COORDINATION ISSUES**

#### **PRELIMINARY CHECKLIST**

##### **PURPOSE**

The U.S. Army Research Institute (USARI) is assisting the U.S. Army Safety Center (USASC) in developing improved techniques for identifying aircrew coordination failures as causal factors in aviation mishaps. During the next several months, USARI and its supporting contractor, Dynamics Research Corporation (DRC) will be involved in demonstrating and refining these techniques during a selected sample of Class A aviation mishap investigations.

##### **PROCEDURE**

Not every mishap involves issues of aircrew coordination. Likewise, it may not be practical to investigate aircrew coordination on every mishap (e.g., those in which there are no surviving crew members). In order to determine if it is appropriate to involve USARI and DRC personnel in the accident investigation, the following procedures have been developed:

1. USASC personnel initially arriving at the mishap site will conduct a preliminary phase of the investigation to determine (1) if the potential exists for aircrew coordination problems to have played a role in the mishap and (2) if appropriate witnesses or other evidence are available to successfully complete a more detailed investigation. The set of questions listed below will be addressed in making this determination.
2. At about the 48-hour point in the investigation, USARI will contact the investigation board to discuss the preliminary findings and determine if it is appropriate for additional investigators to be brought to the mishap site.
3. If a more in-depth investigation, USARI will contact the investigation board to discuss the preliminary findings and determine if it is appropriate for additional investigators to be brought to the mishap site.
4. Upon dispatch to the mishap site, USARI and its contractor personnel will serve as technical advisors to the investigation board and fall under the administrative control of the board president. All information developed from this investigation



will be handled in accordance with established USASC safeguard procedures, and will be made available to board members.

#### **PRELIMINARY QUESTIONS**

1. **Is there evidence that there was an inadequate exchange of information among the crew members during either the planning or flight phase?** Potential evidence includes
  - Statements/directives were not clear, timely, or phrased in standard terminology
  - A crew member failed to raise critical questions or discuss important options
  - A crew member did not announce decisions or actions affecting safety of flight
2. **Is there evidence that there was an inappropriate prioritization or distribution of cockpit tasks among the crew members during the flight?** Potential evidence includes
  - The pilot in command failed to appropriately assign crew duties during the mission pre-brief
  - A crew member allowed himself to be improperly distracted from a critical flying task
  - Crew members demonstrated a lack of coordination during an emergency procedure or abnormal situation
  - The crew member on the controls failed to request/direct appropriate assistance or ask for needed information during a critical maneuver or period of high workload
  - A crew member failed to inform others that they were abandoning an assigned task in order to perform another (lower priority) task
3. **Is there evidence that there was an inadequate cross-monitoring of other crew members during the flight?** Potential evidence includes
  - A crew member failed to detect or report critical errors committed by another because of lack of vigilance, lack of concern, or overconfidence in the other crew member
  - A crew member failed to challenge questionable decisions or actions
  - A crew member failed to offer needed information or assistance during a critical maneuver or period of high workload
4. **Is there evidence of poor interpersonal relationships or unhealthy attitudes which may have affected the aircrew's**

ability to perform as an effective team? Potential evidence includes

- One crew member appears to have dominated or intimidated the others through rank, position, or experience during the flight
- Interactions among crew members were inappropriately restrained, awkward, curt, or disrespectful during or after the flight
- The crew appears to have been unable to resolve a conflict during the flight
- A crew member failed to inform others of their inability to continue performing a critical task

#### TELEPHONE NUMBERS

USARI (Dr. Dennis Leedom)	Duty Hours	(205) 255-4204
		AV 558-4204
	Non-Duty Hours	(205) 794-4538*
DRC (Mr. Dennis Dunn)	Duty Hours	(205) 393-3270*
	& Non-Duty Hours	

\* Leave recorded message if no one answers.

## APPENDIX AA

### FORMAT AND STRUCTURING OF FINDINGS AND RECOMMENDATIONS (Reference: DA Pam 385-95, para 8-6)

I. Findings and recommendations should follow a standard format. Each cause-related finding reported in block 1 of the DA Form 2397-2 should be consistent with the coded summary of accident cause factors in block 2. In addition, each cause-related finding must be fully substantiated by the analysis part (para 4) of DA Form 2397-3. As a minimum, the following elements of information must be reported for each present and contributing finding in the order stated.

- An explanation of when the error, material failure, or environmental factor occurred in the context of the mishap sequence of events; e.g., "during preflight," "takeoff," "cruise flight," etc.

- Identification of the individual involved by duty position; or the name and part number (P/N) or national stock number (NSN) of the part, component, or system that failed; or a description of the environmental factor if appropriate.

- Identification of the task or function the individual was performing and an explanation of how it was performed improperly. Refer to the list of task errors in DA Pam 385-95 for task error categories. The error could be one of omission; e.g., an individual failed to perform a required task or function. In the case of material failure, identify the mode of failure; e.g., corroded, burst, twisted, decayed, etc.

- Identification of the directive governing the performance of the task or function. In lieu of a written directive, the error may represent performance that is contrary to common practice.

- An explanation of the consequences of the error, material failure, or environmental condition. An error may directly result in damaging the aircraft or it may indirectly lead to the same end result. Material failure may have an immediate effect on the aircraft or its performance, or it may create circumstances that cause errors or make further damage inevitable.

- Identification of the reasons (system inadequacies) the error, material failure, or environmental factor caused or contributed to the accident. Refer to the list of system inadequacies in DA Pam 385-95.

- A brief explanation of how each reason (system inadequacy) influenced the error, material failure, or environmental factor.

II. Task Errors resulting from human error:

1. The finding should open with a brief description of the circumstances and conditions under which the accident occurred - "During a night, aided, tactical flight, and while operating at 200 feet AGL and 60 KIAS, -----"

2. The next element should be a simple statement of what the pilot did or failed to do (task error) that caused or directly contributed to the cause of the accident - "the OH-58A pilot misjudged the clearance (T/E 04) between the aircraft rotor and a tall, tree." Avoid use of key words from the Accident Cause Factors listing if they sound stilted or awkward but word the phrase in such a manner the cause factor can be readily identified from the listing.

3. The next element should be a short statement of the result of this error - "As a result, part of the rotor system departed the aircraft when the rotor blades struck the tree. Aircraft control was subsequently lost and the aircraft experienced major damage on ground impact."

4. The question must now be answered as to why the task error occurred (system inadequacy). - "The pilot's actions were the result of fatigue (S/I 09) and improper division of attention (S/I 05). That is the pilot was not mentally alert because he had been up most of the previous night and was tired. Additionally, he was not sufficiently attentive to his obstacle clearance because he was extremely busy in the cockpit reading maps and trying to coordinate, by radio, with the supported ground forces."

5. The recommendations must be aimed at the system inadequacies, not the task error, and should be addressed at three levels of command which include the unit level (platoon/section through battalion), higher level (normally includes brigade through corps), and Army level actions (which includes the MACOM). The finding should require "The Commander" take or initiate action that will result in the desired change(s).

(a) Unit level action: 1. "Commander, (unit involved) emphasize to the unit aviation personnel, the importance of proper rest on crew performance. The unit flight surgeon can be of valuable assistance in both disseminating the information and with monitoring crew endurance."

2. "Commander, (battalion) require the battalion standardization personnel to work closely with the subordinate aviation personnel to more effectively manage the cockpit task loading involved in the tactical missions."

(b) Higher level action: None.

(c) Army level action: "Commander, TRADOC consider initiating a study of the cockpit task loading involved in the tactical missions to determine if the pilots are overloaded and if some to the tasks can be deferred or automated."

### III. Material failures resulting in an accident.

1. The finding(s) resulting from a material failure are structured much the same as a human error finding in that the finding should start with the conditions in which the failure occurred. "During a day terrain flight at 50 feet AGL and 60 KIAS,-----"

2. The next element states what the failure was in general terms. - "the pilot of an OH-58A aircraft experienced loss of main rotor RPM when the engine power turbine governor assembly (P/N 2524910-3) malfunctioned."

3. The result of the failure should then been stated because if a forced or precautionary landing is accomplished without further damage to the aircraft, there would be no requirement for this extensive an investigation. "Due to the airspeed and altitude at which the power turbine governor malfunctioned the pilot was unable to maintain altitude or reach a suitable landing area and the aircraft settled into 30 foot trees resulting in major damage to the aircraft."

4. The cause of the failure/malfunction should next be addressed. "The engine power turbine governor malfunction was due to a corrosion build-up on the control arm shaft assembly. This corrosion restricted the movement of the control arm shaft and resulted in it binding. This restricted movement prevented the governor assembly from properly regulating the engine power."

5. The recommendations must be aimed at the cause of the malfunction, not the malfunction itself. They should also be addressed at three levels of command.

Recommendations: (a) Unit level action: None

(b) Higher level action: None

(c) Army level action: "Commander, Army Material Command 1. as an interim measure, develop an inspection which will detect pending problems with corrosion on the governor assembly control arm shaft before they progress to the point inflight engine power problems result."

2. "Consider initiating action to cause a redesign of the governor assembly which will preclude corrosion forming on the power turbine governor control arm assembly."

IV. When formatting the present but not contributing findings, there exists no requirement to structure them into the above format. However, the format can greatly assist with clearly and concisely stating the complete finding instead of reporting only what happened/was wrong and failing to follow up with the "why" it happened or was wrong. Remember, the recommendations should be addressed to the "why" and not the "what".

V. In addition to the present and contributing and the present but not contributing findings, there is a special category which, on occasion will be appropriate. That is the present and contributing to the severity of damage or injury finding. This finding did not cause or contribute to the cause of the accident but, in fact, contributed to a greater degree or damage or injury than would have occurred had the conditions presented in this finding not been present. Like, the present but not contributing finding, this finding does not have to be structured as does the present and contributing finding but don't over look what the structured format can do to assist in the formulation of a "complete" finding.

APPENDIX BB

Collateral Board

1. The following information may be provided the Collateral Investigation Board.

a. All information contained on the left side, which includes all factual data, but is not limited to the following items:

- (1) Photographs
- (2) Teardown and analysis
- (3) Fuel and oil analysis
- (4) ECOD
- (5) Maintenance records
- (6) Flight plans
- (7) Medical records
- (8) Accident reports
- (9) Autopsy reports
- (10) Weather reports
- (11) List of witness's

b. Information that will not be given the Collateral board is:

- (1) Witness statements
- (2) Findings and recommendations
- (3) Any other analysis or assumptions derived at by the Accident Investigation Board.

## APPENDIX CC

### DAILY UPDATES FROM ACCIDENT SITE

1. Board presidents are expected to provide the Safety Center a daily update to operations from the accident site. This will provide the Safety Center with a picture of what you have done, what your plan to do, and the milestones for key events.

2. The following will be provided to operations: (As Appropriate)

a. USASC investigator arrival and status of forming the board with other personnel.

b. The crash/accident site visit. When, who, impressions.

c. Photos/Diagrams.

d. Review of equipment records.

e. Review of personnel records.

f. Review of flight records to determine; total time, time in type and series, IP time, time on NVG.

g. Crew selection criteria

h. crew station assignments

i. Medical issues; autopsy results.

j. Weather issues.

k. ATC issues

l. Witness interviews. How many/who, when.

m. Deliberations.

n. Draft findings and recommendations, history of flight and analysis.

o. Briefings schedule.

3. USASC needs to know enough information to track the board's progress as it proceeds through the investigation. Use your imagination - give what you would need to write a bullet paper each day that will keep the leaders advised of your progress.



## APPENDIX DD

### CAUSE FACTORS

#### TASK ERROR

- T01 Inadequate inspection/search
- T02 Improper attention
- T03 Failed to recognize
- T04 Misjudged clearance/speed/weight/size/distance
- T05 Misinterpreted
- T06 Failed to anticipate
- T07 Inadequate planning
- T08 Improper decision
- T09 Inadequate improvising/troubleshooting/problem solving
- T10 Failed to follow procedures/orders/laws
- T11 Failed to comply with general rules/principles
- T12 Improper simple physical action (lift, hold, drop, hit, push, pull, sit, stand, reach for, open, close, connect, disconnect, etc.)
- T13 Improper complex physical action (walk, run, crawl, climb, carry, jump, align, adjust, steer, brake, etc.)
- T14 Inadequate communication (ask, answer, signal, inform, etc.)
- T97 Insufficient info reported to identify task error.

#### MATERIEL FAILURE/MALFUNCTION

- M01 Overheated/burned/melted
- M02 Froze (temperature)
- M03 Obstructed/pinched/clogged
- M04 Vibrated
- M05 Rubbed/worn/frayed
- M06 Corroded/rusted/pitted
- M07 Overpressured/burst
- M08 Pulled/stretched
- M09 Twisted/torqued
- M10 Compressed/hit/punctured
- M11 Bent/warped
- M12 Sheared/cut
- M13 Decayed/decomposed
- M14 Electric current action (short, arc, surge, etc.)
- M97 Insufficient information to identify type of failure/malfunction

# ENVIRONMENTAL CONDITION

- E01 Illumination (dark, glare, etc.)
- E02 Precipitation (rain, fog, ice, snow, etc.)
- E03 Contaminants (fumes, dust, chemical, FOD, etc.)
- E04 Noise
- E05 Temperature/Humidity
- E06 Wind/turbulence
- E07 Vibration
- E08 Acceleration/deceleration
- E09 Radiation (sunlight, x-ray, laser, etc.)
- E10 Work surface/space (slippery floor, cluttered walkway, steep rough road, etc.)
- E11 Air pressure (explosion, decompression, altitude effects, etc.)
- E12 Electricity (lightning, arc, surge, short, shock, etc.)
- E13 Animals (deer, birds, rodents, insects, etc.)
- E97 Insufficient information to identify environmental condition.
- T97 Insufficient information reported to identify cause factor.
- T98 Not applicable, i.e., Army not at fault, training realism, certain competitive sports.

## SYSTEM INADEQUACY

- 01 Inadequate school training
- 02 Inadequate unit training
- 03 Inadequate experience
- 04 Inadequate composure
- 05 Inadequate attention
- 06 Overconfidence (in self, others, equipment)
- 07 Lack of confidence (in self, others, equipment)
- 08 Inadequate motivation/mood (haste, command pressure, excessive self-motivation, improper attitude, etc.)
- 09 Fatigue
- 10 Effects of alcohol, drugs, or illness
- 11 Habit interference
- 12 Environment condition
- 13 Inadequate facilities or services
- 14 Equip/materiel improperly designed/not provided
- 15 Inadequate manufacture, assembly, packaging, or quality control
- 16 Inadequate maintenance (inspection, installation, troubleshooting, recordkeeping, etc.)
- 17 Improper use of tool, equipment, or materiel
- 18 Inadequate written procedures for operation under normal conditions
- 19 Inadequate written procedures for operation under abnormal conditions

### INADEQUATE SUPERVISION OR COORDINATION BY:

- 20 Higher command
- 21 Unit command
- 22 Staff officer (operations, maintenance, supply, safety, training, etc.)
- 23 Direct supervisor (instructor, platoon leader, squad leader, vehicle commander, noncommissioned officer in charge, etc.)
- 97 Insufficient information
- 98 not applicable

## REMEDIAL MEASURE

- 01 Improve school training
- 02 Improve unit training
- 03 Revise procedures for operation under normal conditions
- 04 Revise procedures for operation under abnormal or emergency conditions
- 05 Ensure personnel are ready to perform (training, experience, psychophysiological state, etc.)
- 06 Inform personnel of problems and remedies (meetings, publications, EIR's, etc.)
- 07 Positive command action (to encourage proper performance and discourage improper performance)
- 08 Provide personnel resources (number or qualifications) required for job
- 09 Redesign (or provide) equipment or materiel
- 10 Improve (or provide) facilities or services
- 11 Improve quality control
- 12 Perform studies to get solutions to system inadequacy

### IMPROVE SUPERVISION OR COORDINATION BY:

- 20 Higher command
- 21 unit command
- 22 Staff officer
- 23 Direct supervisor
- 97 Insufficient information
- 98 not applicable